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Flight Dynamics Analysis and Simulation of Heavy Lift Airships

Volume IV: User's Guide - Appendices

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Mark B. Tischler
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Robert F. Ringland
Mark B. Tischler
Henry R. Jex
Roger D. Emmen
Irving L. Ashkenas
Systems Technology, Inc.
Hawthorne, California

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National Aeronautics and
Space Administration

Ames Research Center
Moffett Field, California 94035

FOREWORD

This document is the fourth in a five volume report which describes a comprehensive digital computer simulation of the dynamics of heavy lift airships and generically similar vehicles.

The work was performed by Systems Technology, Inc., Hawthorne, California for the Aeronautical Systems Branch in the Helicopter and Powered Lift Division of the National Aeronautics and Space Administration, Ames Research Center, Moffett Field, California. The simulation development was carried on between September 1979 and January 1982 and is currently installed on the Ames Research Center CDC 7600 computer. The contract technical monitors for NASA were Dr. Mark Ardema, Mr. Alan Faye, and Mr. Peter Talbot. STI's Program Manager was Mr. Irving Ashkenas.

The authors wish to acknowledge the technical contributions of Mr. Robert Heffley, Mr. Thomas Myers, and Mr. Samuel Craig and the further contributions of Mr. Allyn Hall, Ms. Natalie Hokama and Ms. Leslie Hokama in simulation software development. Special thanks are due to Ms. Kay Wade, Ms. Linda Huffman, Mr. Charles Reaber, and STI's production department for the preparation of the five volumes of this report.

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APPENDIX A

INPUT VARIABLES

This table contains all of the input variables to the three programs. The variables are arranged according to the namelist groups in which they appear in the data files. The program name, subroutine name, definition and, where appropriate, a default input value and any restrictions are listed with each variable.

The default input values are user supplied, not generated by the computer. These values remove a specific effect from the calculations, as explained in the table. The phrase "not used" indicates that a variable is not used in the calculations and are for identification purposes only.

The engineering symbol, where it exists, is listed to assist the user in correlating these inputs with the discussion in the Technical Manual (Volume II).

Data File GMDTA

VARIABLE NAME	a) PROGRAM(S) b) INPUT SUBROUTINE	DEFINITION	DEFAULT INPUT VALUES	ENGINEERING SYMBOL	CONDITIONS
Namelist NHULL					
HULTH	a) HLASIM HLAMOR HLAPAY b) HGEOM	Hull overall length	0.0 No hull length effect for ground contact calculation	ℓ_h	
HULDIA	a) HLASIM HLAMOR HLAPAY b) HGEOM	Hull maximum diameter		d_h	$d_h > 0$
HULVOL	a) HLASIM HLAMOR HLAPAY b) HGEOM	Total displaced volume of external hull envelope	0. No hull buoyancy forces	$\forall$	
HULARA	a) HLASIM HLAMOR HLAPAY b) HGEOM	Hull side projected area	Not used		
HULID	a) HLASIM HLAMOR HLAPAY b) HGEOM	Hull configuration identifier	Not used		

Data File GMDTA

VARIABLE NAME	a) PROGRAM(S) b) INPUT SUBROUTINE	DEFINITION	DEFAULT INPUT VALUES	ENGINEERING SYMBOL	CONDITIONS
		Namelist NTAIL			
NUMFIN	a) HLASIM HLAMOR HLAPAY b) HGEOM	Number of fins in tail ensemble	Not used		
RTALOC	a) HLASIM HLAMOR HLAPAY b) HGEOM	Vector locating the tail reference center with respect to the hull center of volume reference axes		$\underline{R}^{ht}_{hcv}$	
TALARA	a) HLASIM HLAMOR HLAPAY b) HGEOM	Tail ensemble reference area	Not used		
TSPAN	a) HLASIM HLAMOR HLAPAY b) HGEOM	Tail ensemble reference span	$b_t = 0$; Eliminate tail contributions which are dependent on roll rate	b_t	
TALID	a) HLASIM HLAMOR HLAPAY b) HGEOM	Tail ensemble configuration identifier	Not used		

Data File GMDTA

VARIABLE NAME	a) PROGRAM(S) b) INPUT SUBROUTINE	DEFINITION	DEFAULT INPUT VALUES	ENGINEERING SYMBOL	CONDITIONS
		Namelist NRATCH			
RATCH1 RATCH2 RATCH3 RATCH4	a) HLASIM HLAMOR HLAPAY b) HGEOM	Four vectors locating the attach point of the LPU on the hull, with respect to the hull center of volume reference axes		R^{hi}_{hcv}	
		Namelist NLPU			
NUMLPU	a) HLASIM HLAMOR HLAPAY b) LPGEOM	Number of lift prop units (LPUs)	Not used		
LPUID	a) HLASIM HLAMOR HLAPAY b) LPGEOM	LPU configuration identifies	Not used		
		Namelist NRROTR			
RROTR1 RROTR2 RROTR3 RROTR4	a) HLASIM HLAMOR HLAPAY b) LPGEOM	Four vectors locating each rotor hub with respect to coordinates in the LPU fuselage reference axes	0., 0., 0. Rotor hub is coincident with fuselage reference center	R^{ir}_{ifc}	

Data File GMDTA

VARIABLE NAME	a) PROGRAM(S) b) INPUT SUBROUTINE	DEFINITION	DEFAULT INPUT VALUES	ENGINEERING SYMBOL	CONDITIONS
		Namelist NRGEOM			
NRBLD1 NRBLD2 NRBLD3 NRBLD4	a) HLASIM HLAMOR HLAPAY b) LPGEOM	Number of rotor blades per rotor disk		b_r	$b > 0$
RADRT1 RADRT2 RADRT3 RADTR4	a) HLASIM HLAMOR HLAPAY b) LPGEOM	Rotor radius		R_r	$R > 0$
CORDR1 CORDR2 CORDR3 CORDR4	a) HLASIM HLAMOR HLAPAY b) LPGEOM	Effective rotor blade chord measured at the three-quarters radius station		c_r	$c > 0$
		Namelist NRPROP			
RPROP1 RPROP2 RPROP3 RPROP4	a) HLASIM HLAMOR HLAPAY b) LPGEOM	Four vectors locating the propeller hub of each LPU with respect to coordinates in the LPU fuselage reference axes	0., 0., 0. Propeller hub is coincident with fuselage reference center	$\underline{R}^{ip}_{ifc}$	
		Namelist NPGEOM			
NPBLD1 NPBLD2 NPBLD3 NPBLD4	a) HLASIM HLAMOR HLAPAY b) LPGEOM	Number of propeller blades per propeller disk		b_p	$b > 0$
RADP1 RADP2 RADP3 RADP4	a) HLASIM HLAMOR HLAPAY b) LPGEOM	Propeller radius		R_p	$R > 0$
CORDP1 CORDP2 CORDP3 CORDP4	a) HLASIM HLAMOR HLAPAY b) LPGEOM	Effective propeller blade chord measured at the three-quarters radius station		c_p	$c > 0$

Data File GMDTA

VARIABLE NAME	a) PROGRAM(S) b) INPUT SUBROUTINE	DEFINITION	DEFAULT INPUT VALUES	ENGINEERING SYMBOL	CONDITIONS
			Namelist NPRPRIG		
A1SP1 A1SP2 A1SP3 A1SP4	a) HLASIM HLAMOR HLAPAY b) LPGEOM	Propeller shaft lateral Euler angle orientation with respect to the LPU c.g. axes; a positive deflection is in a positive sense about the positive x-axis	0. This orientation angle is zero	$A_{1_{sp}}$	
B1SP1 B1SP2 B1SP3 B1SP4	a) HLASIM HLAMOR HLAPAY b) LPGEOM	Propeller shaft longitudinal Euler angle orientation with respect to the LPU c.g axes; a positive deflection is taken in a negative sense about the positive y-LPU c.g. reference axis	0. This orientation angle is zero	$B_{1_{sp}}$	
			Namelist NRLTCH		
RLTCH1 RLTCH2 RLTCH3 RLTCH4	a) HLASIM HLAMOR HLAPAY b) LPGEOM	Four vectors locating each attach point on the LPU with respect to the LPU fuselage references axes	0., 0., 0. Hull attach point on LPU is coincident with LPU fuselage reference center	$\underline{R}_{ifc}^{ih}$	
			Namelist NGBANG		
GBANG1 GBANG2 GBANG3 GBANG4	a) HLASIM HLAMOR HLAPAY b) LPGEOM	Four vectors each containing the LPU Euler angles, with respect to the hull reference axes: ϕ_i, θ_i, ψ_i	0., 0., 0. LPU body axes are aligned parallel to hull body axes	$\underline{n}_h^i$	

Data File GMDTA

VARIABLE NAME	a) PROGRAM(S) b) INPUT SUBROUTINE	DEFINITION	DEFAULT INPUT VALUES	ENGINEERING SYMBOL	CONDITIONS
		Namelist NMAST			
MASTLC	a) HLASIM HLAMOR HLAPAY b) INMOOR	Vector locating the attach point on the mooring mast with respect to the inertial reference axes in coordinates of the inertial reference axes		$\underline{R}_I^{Ih}$	$\underline{R}_I^{Ih}(3) < 0$
RMORPT	a) HLASIM HLAMOR HLAPAY b) INMOOR	Vector locating the attach point of the mooring mast on the vehicle relative to the hull center of volume in coordinates of the hull c.g. reference axis		$\underline{R}_{th}^{hm}$	
		Namelist NRATHG			
RATHG1 RATHG2 RATHG3 RATHG4	a) HLASIM HLAMOR HLAPAY b) INGEAR	Vectors locating the gear attach point on the hull structural frame with respect to hull center of volume in coordinates of the hull c.g. reference axis		$\underline{R}_{thcv}^{ht}$	
		Namelist NLANDGL			
LGRLN1 LGRLN2 LGRLN3 LGRLN4	a) HLASIM HLAMOR HLAPAY b) INGEAR	Unstretched (relaxed) landing gear length, these values must all be positive		ℓ_{0_g}	$\ell_{0_g} > 0$
		Namelist NGEARK			
GEARK1 GEARK2 GEARK3 GEARK4	a) HLASIM HLAMOR HLAPAY b) INGEAR	Spring constants of the landing gears	0. This landing gear is disabled	K_g	$K_g \geq 0$

Data File GMDTA

VARIABLE NAME	a) PROGRAM(S) b) INPUT SUBROUTINE	DEFINITION	DEFAULT INPUT VALUES	ENGINEERING SYMBOL	CONDITIONS
		Namelist NGFRAMK			
GFRMK1 GFRMK2 GFRMK3 GFRMK4	a) HLASIM HLAMOR HLAPAY b) INGEAR	Spring constants for the hull frame which supports the landing gear attach point	0. No structural spring stiffness in this landing gear frame	K_f	$K_f \geq 0$
		Namelist NGEARC			
GEARC1 GEARC2 GEARC3 GEARC4	a) HLASIM HLAMOR HLAPAY b) INGEAR	Damping constants of the landing gear	0. No viscous damping in this landing gear	C_g	$C_g \geq 0$
		Namelist NMUKG			
MUKG1 MUKG2 MUKG3 MUKG4	a) HLASIM HLAMOR HLAPAY b) INGEAR	Rolling friction constants for the landing gear tires; these values should always be positive	0. No kinetic (sliding, rolling) friction in this landing gear	μ_k	$\mu_k \geq 0$
		Namelist NRHULCG			
RHULCG	a) HLASIM HLAMOR HLAPAY b) INMASS	Location of hull center of gravity with respect to hull center of volume reference axes	0., 0., 0. Hull center of gravity is coincident with hull center of volume	R^h_{hcv}	

Data File GMDTA

VARIABLE NAME	a) PROGRAM(S) b) INPUT SUBROUTINE	DEFINITION	DEFAULT INPUT VALUES	ENGINEERING SYMBOL	CONDITIONS
		Namelist NMASHUL			
MASHUL	a) HLASIM HLAMOR HLAPAY b) INMASS	Mass of the hull component includes envelope, fins, support structures, and internal gases		m_h	$m_h > 0$
IHULXX	a) HLASIM HLAMOR HLAPAY b) INMASS	Hull moment of inertia about the hull c.g. x-axes		I_{xx_h}	$I_{xx_h} > 0$
IHULYY	a) HLASIM HLAMOR HLAPAY b) INMASS	Hull moment of inertia about the hull c.g. y-axes		I_{yy_h}	$I_{yy_h} > 0$
IHULZZ	a) HLASIM HLAMOR HLAPAY b) INMASS	Hull moment of inertia about the hull c.g. z-axes		I_{zz_h}	$I_{zz_h} > 0$
IHULXZ	a) HLASIM HLAMOR HLAPAY b) INMASS	Hull product of inertia with respect to the hull c.g. xz-axes	0. Hull body axes are coincident with hull principal axes	I_{xz_h}	
		Namelist NRCGLPU			
RCGLP1 RCGLP2 RCGLP3 RCGLP4	a) HLASIM HLAMOR HLAPAY b) INMASS	Four vectors locating each LPU c.g. with respect to the LPU fuselage reference axes	0., 0., 0. LPU center of gravity is coincident with fuselage reference center	R^i_{ifc}	

Data File GMDTA

VARIABLE NAME	a) PROGRAM(S) b) INPUT SUBROUTINE	DEFINITION	DEFAULT INPUT VALUES	ENGINEERING SYMBOL	CONDITIONS
		Namelist NMASLP1 Namelist NMASLP2 Namelist NMASLP3 Namelist NMASLP4			
MASLP1 MASLP2 MASLP3 MASLP4	a) HLASIM HLAMOR HLAPAY b) INMASS	Masses of the four LPUs		m_i	$m_i > 0$
ILP1XX ILP2XX ILP3XX ILP4XX	a) HLASIM HLAMOR HLAPAY b) INMASS	LPU moment of inertia about the LPU c.g. x-axes		I_{xx_i}	$I_{xx_i} > 0$
ILP1YY ILP2YY ILP3YY ILP4YY	a) HLASIM HLAMOR HLAPAY b) INMASS	LPU moment of inertia about the LPU c.g. y-axes		I_{yy_i}	$I_{yy_i} > 0$
ILP1ZZ ILP2ZZ ILP3ZZ ILP4ZZ	a) HLASIM HLAMOR HLAPAY b) INMASS	LPU moment of inertia about the LPU c.g. z-axes		I_{zz_i}	$I_{zz_i} > 0$
ILP1XZ ILP2XZ ILP3XZ ILP4XZ	a) HLASIM HLAMOR HLAPAY b) INMASS	LPU products of inertia about the LPU c.g. xz-axes	0. LPU body axes are coincident with LPU principal axes	I_{xz_i}	$I_{xz_i} > 0$

Data File GMDTA

VARIABLE NAME	a) PROGRAM(S) b) INPUT SUBROUTINE	DEFINITION	DEFAULT INPUT VALUES	ENGINEERING SYMBOL	CONDITIONS
			Namelist NLOCKNR		
LOCNR1 LOCNR2 LOCNR3 LOCNR4	a) HLASIM HLAMOR HLAPAY b) INMASS	Rotor blade lock number		γ	$\gamma > 0$
			Namelist NJETHST		
JETHS1 JETHS2 JETHS3 JETHS4	a) HLASIM HLAMOR HLAPAY b) INEXST	Jet exhaust magnitudes	0. No jet exhaust thrust	T_e	
REXLC1 REXLC2 REXLC3 REXLC4	a) HLASIM HLAMOR HLAPAY b) INEXST	Four vectors locating the position of the jet exhaust nozzles with respect to the fuselage reference axis	0., 0., 0. Jet exhaust nozzle is coincident with fuselage reference center	$\underset{\sim}{R}^{I_e}_{ifc}$	
			Namelist NJETHSA		
A1SE1 A1SE2 A1SE3 A1SE4	a) HLASIM HLAMOR HLAPAY b) INEXST	Jet exhaust lateral Euler angle orientation with respect to c.g. axis; a positive jet exhaust angle is in a positive sense about the positive x-axis	0. This orientation angle is zero	$A_{1_{s_e}}$	
B1SE1 B1SE2 B1SE3 B1SE4	a) HLASIM HLAMOR HLAPAY b) INEXST	Jet exhaust longitudinal Euler angle orientation with respect to the LPU c.g. axis; a positive jet exhaust longitudinal Euler angle is taken in a negative sense about the positive y-LPU c.g. reference axis	0. This orientation angle is zero	$B_{1_{s_e}}$	

Data File ARODTA

VARIABLE NAME	a) PROGRAM(S) b) INPUT SUBROUTINE	DEFINITION	DEFAULT INPUT VALUES	ENGINEERING SYMBOL	CONDITIONS
	Namelist NRACLP				
RACLP1 RACLP2 RACLP3 RACLP4	a) HLASIM HLAMOR HLAPAY b) INLARO	Four vectors locating the LPU aerodynamic center of each LPU, with respect to the LPU fuselage reference axes	0., 0, 0. Fuselage aerodynamic center is coincident with fuselage reference center	$\underline{R}^{if}_{ifc}$	
	Namelist NAROCN				
LCRS1 LCSR2 LCSR3 LCSR4	a) HLASIM HLAMOR HLAPAY b) INLARO	Rotor blade lift curve slope	0. Eliminates rotor thrust for this LPU	a_{o_r}	$a_{o_r} \geq 0$
DLTR1A DLTR2A DLTR3A DLTR4A	a) HLASIM HLAMOR HLAPAY b) INLARO	Constant term in quadratic equation for rotor profile drag coefficient	0. Eliminates term in rotor drag quadratic equation	δ_{a_r}	
DLTR1B DLTR2B DLTR3B DLTR4B	a) HLASIM HLAMOR HLAPAY b) INLARO	Linear term in quadratic function for rotor blade profile drag coefficient	0. Eliminates term in rotor drag quadratic equation	δ_{b_r}	
DLTR1C DLTR2C DLTR3C DLTR4C	a) HLASIM HLAMOR HLAPAY b) INLARO	Quadratic term in quadratic function for rotor blade drag coefficient	0. Eliminates term in rotor drag quadratic equation	δ_{c_r}	

Data File ARODTA

VARIABLE NAME	a) PROGRAM(S) b) INPUT SUBROUTINE	DEFINITION	DEFAULT INPUT VALUES	ENGINEERING SYMBOL	CONDITIONS
		Namelist NPAROCN			
LCSP1 LCSP2 LCSP3 LCSP4	a) HLASIM HLAMOR HLAPAY b) INLARO	Propeller blade lift curve slope	0. Eliminates propeller thrust for this LPU	a_{o_p}	$a_{o_p} \geq 0$
DLTP1A DLTP2A DLTP3A DLTP4A	a) HLASIM HLAMOR HLAPAY b) INLARO	Constant term in quadratic function for propeller blade profile drag coefficient	0. Eliminates term in propeller drag quadratic equation	δ_{a_p}	
DLTP1B DLTP2B DLTP3B DLTP4B	a) HLASIM HLAMOR HLAPAY b) INLARO	Linear term in quadratic function for propeller blade profile drag coefficient	0. Eliminates term in propeller drag quadratic equation	δ_{b_p}	
DLTP1C DLTP2C DLTP3C DLTP4C	a) HLASIM HLAMOR HLAPAY b) INLARO	Quadratic term in quadratic function for propeller blade profile drag coefficient	0. Eliminates term in propeller drag quadratic equation	δ_{c_p}	
		Namelist NFAROCN			
XUUAF1 XUUAF2 XUUAF3 XUUAF4	a) HLASIM HLAMOR HLAPAY b) INLARO	LPU fuselage X-force derivative with respect to U*ABS(U)	0. Eliminates this fuselage aerodynamic term	$X_{u\|u\|_f}$	
YVVAF1 YVVAF2 YVVAF3 YVVAF4	a) HLASIM HLAMOR HLAPAY b) INLARO	LPU fuselage Y-force derivative with respect to V*ABS(V)	0. Eliminates this fuselage aerodynamic term	$Y_{v\|v\|_f}$	
ZWWAF1 ZWWAF2 ZWWAF3 ZWWAF4	a) HLASIM HLAMOR HLAPAY b) INLARO	LPU fuselage Z-force derivative with respect to W*ABS(W)	0. Eliminatesthis fuselage aerodynamic term	$Z_{w\|w\|_f}$	

Data File ARODTA

VARIABLE NAME	a) PROGRAM(S) b) INPUT SUBROUTINE	DEFINITION	DEFAULT INPUT VALUES	ENGINEERING SYMBOL	CONDITIONS
Namelist NHDTDRV					
XUDOTH	a) HLASIM HLAMOR HLAPAY b) INHARO	Hull x-force derivative with respect to longitudinal acceleration	0. Eliminates this hull aerodynamic term	$X_{\dot{u}_h}$	
YVDOTH	a) HLASIM HLAMOR HLAPAY b) INHARO	Hull y-force derivative with respect to lateral acceleration	0. Eliminates this hull aerodynamic term	$Y_{\dot{v}_h}$	
ZWDOTH	a) HLASIM HLAMOR HLAPAY b) INHARO	Hull z-force derivative with respect to normal acceleration	0. Eliminates this hull aerodynamic term	$Z_{\dot{w}_h}$	
LPDOTH	a) HLASIM HLAMOR HLAPAY b) INHARO	Hull rolling moment derivative with respect to rolling acceleration	0. Eliminates this hull aerodynamic term	$L_{\dot{p}_h}$	
MQDOTH	a) HLASIM HLAMOR HLAPAY b) INHARO	Hull pitching moment derivative with respect to pitching acceleration	0. Eliminates this hull aerodynamic term	$M_{\dot{q}_h}$	
NRDOTH	a) HLASIM HLAMOR HLAPAY b) INHARO	Hull yawing moment derivative with respect to yaw acceleration	0. Eliminates this hull aerodynamic term	$N_{\dot{r}_h}$	

Data File AHODTA

VARIABLE NAME	a) PROGRAM(S) b) INPUT SUBROUTINE	DEFINITION	DEFAULT INPUT VALUES	ENGINEERING SYMBOL	CONDITIONS
Namelist NTDTDRV					
YVDOTT	a) HLASIM HLAMOR HLAPAY b) INHARO	Tail y-force derivative with respect to lateral acceleration	0. Eliminates this tail aerodynamic term	$Y_{\dot{v}_t}$	
ZWDOTT	a) HLASIM HLAMOR HLAPAY b) INHARO	Tail z-force derivative with respect to normal acceleration	0. Eliminates this tail aerodynamic term	$Z_{\dot{w}_t}$	
LVDOTT	a) HLASIM HLAMOR HLAPAY b) INHARO	Tail rolling moment derivative with respect to lateral acceleration	0. Eliminates this tail aerodynamic term	$L_{\dot{v}_t}$	
LPDOTT	a) HLASIM HLAMOR HLAPAY b) INHARO	Tail rolling moment derivative with respect to rolling acceleration	0. Eliminates this tail aerodyn - mic term	$L_{\dot{p}_t}$	
MQDOTT	a) HLASIM HLAMOR HLAPAY b) INHARO	Tail pitching moment derivative with respect to pitching acceleration	0. Eliminates this tail aerodynamic term	$M_{\dot{q}_t}$	
NRDOTT	a) HLASIM HLAMOR HLAPAY b) INHARO	Tail yawing moment derivative with respect to yawing acceleration	0. Eliminates this tail aerodynamic term	$N_{\dot{r}_t}$	

Data File AERODTA

VARIABLE NAME	a) PROGRAM(S) b) INPUT SUBROUTINE	DEFINITION	DEFAULT INPUT VALUES	ENGINEERING SYMBOL	CONDITIONS
		Namelist NHDRVS			
XUUABH	a) HLASIM HLAMOR HLAPAY b) INHARO	Hull x-force derivative with respect to U*ABS(U)	0. Eliminates this hull aerodynamic term	$X_{u\|u\|h}$	
XQWH	a) HLASIM HLAMOR HLAPAY b) INHARO	Hull x-force derivative with respect to Q*W	0. Eliminates this hull aerodynamic term	X_{qwh}	
XRVH	a) HLASIM HLAMOR HLAPAY b) INHARO	Hull x-force derivative with respect to R*V	0. Eliminates this hull aerodynamic term	X_{rvh}	
YVVABH	a) HLASIM HLAMOR HLAPAY b) INHARO	Hull y-force derivative with respect to V*ABS(V)	0. Eliminates this hull aerodynamic term	$Y_{v\|v\|h}$	
YRRABH	a) HLASIM HLAMOR HLAPAY b) INHARO	Hull y-force derivative with respect to R*ABS(R)	0. Eliminates this hull aerodynamic term	$Y_{r\|r\|h}$	
YPWH	a) HLASIM HLAMOR HLAPAY b) INHARO	Hull y-force derivative with respect to P*W	0. Eliminates this hull aerodynamic term	Y_{pwh}	
YRUH	a) HLASIM HLAMOR HLAPAY b) INHARO	Hull y-force derivative with respect to R*U	0. Eliminates this hull aerodynamic term	Y_{ruh}	

Data File ARODTA

VARIABLE NAME	a) PROGRAM(S) b) INPUT SUBROUTINE	DEFINITION	DEFAULT INPUT VALUES	ENGINEERING SYMBOL	CONDITIONS
		Namelist NHDRVS (Continued)			
NRVABH	a) HLASIM HLAMOR HLAPAY b) INHARO	Hull y-force derivative with respect to R*ABS(V)	0. Eliminates this hull aerodynamic term	$Y_{r\|v\|h}$	
ZWWABH	a) HLASIM HLAMOR HLAPAY b) INHARO	Hull z-force derivative with respect to W*ABS(W)	0. Eliminates this hull aerodynamic term	$Z_{w\|w\|h}$	
ZQQABH	a) HLASIM HLAMOR HLAPAY b) INHARO	Hull z-force derivative with respect to Q*ABS(Q)	0. Eliminates this hull aerodynamic term	$Z_{q\|q\|h}$	
ZPVH	a) HLASIM HLAMOR HLAPAY b) INHARO	Hull z-force derivative with respect to P*V	0. Eliminates this hull aerodynamic term	Z_{pv_h}	
ZQUH	a) HLASIM HLAMOR HLAPAY b) INHARO	Hull z-force derivative with respect to Q*U	0. Eliminates this hull aerodynamic term	Z_{qu_h}	
ZQWABH	a) HLASIM HLAMOR HLAPAY b) INHARO	Hull z-force derivative with respect to Q*ABS(W)	0. Eliminates this hull aerodynamic term	$Z_{q\|w\|h}$	
LPPABH	a) HLASIM HLAMOR HLAPAY b) INHARO	Hull rolling moment derivative with respect to P*ABS(P)	0. Eliminates this hull aerodynamic term	$L_{p\|p\|h}$	

Data File ARODTA

VARIABLE NAME	a) PROGRAM(S) b) INPUT SUBROUTINE	DEFINITION	DEFAULT INPUT VALUES	ENGINEERING SYMBOL	CONDITIONS
Namelist NHDRVS (Continued)					
LPUABH	a) HLASIM HLAMOR HLAPAY b) INHARO	Hull rolling moment derivative with respect to P*ABS(U)	0. Eliminates this hull aerodynamic term	$L_{p\|u\|h}$	
LVWH	a) HLASIM HLAMOR HLAPAY b) INHARO	Hull rolling moment derivative with respect to V*W	0. Eliminates this hull aerodynamic term	L_{vwh}	
LQBRH	a) HLASIM HLAMOR HLAPAY b) INHARO	Hull rolling moment derivative with respect to QB*R	0. Eliminates this hull aerodynamic term	$L_{\bar{q}rh}$	
LRBQH	a) HLASIM HLAMOR HLAPAY b) INHARO	Hull rolling moment derivative with respect to RB*Q	0. Eliminates this hull aerodynamic term	$L_{\bar{r}qh}$	
MQQABH	a) HLASIM HLAMOR HLAPAY b) INHARO	Hull pitching moment derivative with respect to Q*ABS(Q)	0. Eliminates this hull aerodynamic term	$M_{q\|q\|h}$	
MUWH	a) HLASIM HLAMOR HLAPAY b) INHARO	Hull pitching moment derivative with respect to U*W	0. Eliminates this hull aerodynamic term	M_{uwh}	
MRBPH	a) HLASIM HLAMOR HLAPAY b) INHARO	Hull pitching moment derivative with respect to RB*P	0. Eliminates this hull aerodynamic term	$L_{\bar{r}ph}$	

Data File AERODTA

VARIABLE NAME	a) PROGRAM(S) b) INPUT SUBROUTINE	DEFINITION	DEFAULT INPUT VALUES	ENGINEERING SYMBOL	CONDITIONS
Namelist NHDRVS (Concluded)					
MPBRH	a) HLASIM HLAMOR HLAPAY b) INHARO	Hull pitching moment derivative with respect to PB*R	0. Eliminates this hull aerodynamic term	$M_{\bar{p}r_h}$	
MQWABH	a) HLASIM HLAMOR HLAPAY b) INHARO	Hull pitching moment derivative with respect to Q*ABS(W)	0. Eliminates this hull aerodynamic term	$M_{q\|w\|_h}$	
NRRABH	a) HLASIM HLAMOR HLAPAY b) INHARO	Hull yawing derivative with respect to R*ABS(R)	0. Eliminates this hull aerodynamic term	$N_{r\|r\|_h}$	
NUVH	a) HLASIM HLAMOR HLAPAY b) INHARO	Hull yawing moment derivative with respect to U*V	0. Eliminates this hull aerodynamic term	N_{uv_h}	
NPBQH	a) HLASIM HLAMOR HLAPAY b) INHARO	Hull yawing derivative with respect to PB*Q	0. Eliminates this hull aerodynamic term	$N_{\bar{p}q_h}$	
NQBPH	a) HLASIM HLAMOR HLAPAY b) INHARO	Hull yawing derivative with respect to QB*P	0. Eliminates this hull aerodynamic term	$N_{\bar{q}p_h}$	
NRVABH	a) HLASIM HLAMOR HLAPAY b) INHARO	Hull yawing moment derivative with respect to R*ABS(R)	0. Eliminates this hull aerodynamic term	$N_{r\|v\|_h}$	

Data File ARODTA

VARIABLE NAME	a) PROGRAM(S) b) INPUT SUBROUTINE	DEFINITION	DEFAULT INPUT VALUES	ENGINEERING SYMBOL	CONDITIONS
Namelist NTDRVS					
XUUABT	a) HLASIM HLAMOR HLAPAY b) INHARO	Tail x-force derivative with respect to U*ABS(U)	0. Eliminates this tail aerodynamic term	$X_{u\|u\|_t}$	
YVVABT	a) HLASIM HLAMOR HLAPAY b) INHARO	Tail y-force derivative with respect to V*ABS(V)	0. Eliminates this tail aerodynamic term	$Y_{v\|v\|_t}$	
YPPABT	a) HLASIM HLAMOR HLAPAY b) INHARO	Tail y-force derivative with respect to P*ABS(P)	0. Eliminates this tail aerodynamic term	$Y_{p\|p\|_t}$	
YAPVST	a) HLASIM HLAMOR HLAPAY b) INHARO	Tail y-force derivative with respect to ALPHA-P * (VPT**2.))	0. Eliminates this tail aerodynamic term	$Y_{\alpha_p V_t^2}$	
YBVSQT	a) HLASIM HLAMOR HLAPAY b) INHARO	Tail y-force derivative with respect to (BETA * (VXYT**2.))	0. Eliminates this tail aerodynamic term	$Y_{\beta V_t^2}$	
YBSVST	a) HLASIM HLAMOR HLAPAY b) INHARO	Tail y-force derivative with respect to (BETA*2. (VXYT**2.))	0. Eliminates this tail aerodynamic term	$Y_{\beta^2 V_t^2}$	
YAPSVS	a) HLASIM HLAMOR HLAPAY b) INHARO	Tail y-force derivative with respect to ALPHA-P*ABS(ALPHA-P) * (VPT**2)	0. Eliminates this tail aerodynamic term	$Y_{\alpha_p^2 V_t^2}$	
ZWWABT	a) HLASIM HLAMOR HLAPAY b) INHARO	Tail z-force derivative with respect to W*ABS(W)	0. Eliminates this tail aerodynamic term	$Z_{w\|w\|_t}$	

Data File ARODTA

VARIABLE NAME	a) PROGRAM(S) b) INPUT SUBROUTINE	DEFINITION	DEFAULT INPUT VALUES	ENGINEERING SYMBOL	CONDITIONS
Namelist NTDRVS (Concluded)					
ZAVSQT	a) HLASIM HLAMOR HLAPAY b) INHARO	Tail y-force derivative with respect to ALPHA * (VXZT**2))	0. Eliminates this tail aerodynamic term	$Z_{\alpha V_t^2}$	
ZASVST	a) HLASIM HLAMOR HLAPAY b) INHARO	Tail z-force derivative with respect to (ALPHA**2 (VXZT**2))	0. Eliminates this tail aerodynamic term	$Z_{\alpha^2 V_t^2}$	
LVVABT	a) HLASIM HLAMOR HLAPAY b) INHARO	Tail roll moment derivative with respect to V*ABS(V)	0. Eliminates this tail aerodynamic trm	$L_{v\|v\|_t}$	
LPPABT	a) HLASIM HLAMOR HLAPAY b) INHARO	Tail rolling moment derivative with respect to P*ABS(P)	0. Eliminates this tail aerodynamic term	$L_{p\|p\|_t}$	
LAPVST	a) HLASIM HLAMOR HLAPAY b) INHARO	Tail rolling moment derivative with respect to ALPHA-P * (VPT**2.))	0. Eliminates this tail aerodynamic term	$L_{\alpha_p V_t^2}$	
LBVSQT	a) HLASIM HLAMOR HLAPAY b) INHARO	Tail rolling moment derivative with respect to (BETA*(VXYT**2.))	0. Eliminates this tail aerodynamic term	$L_{\beta V_t^2}$	
LBAVST	a) HLASIM HLAMOR HLAPAY b) INHARO	Tail rolling moment derivative with respect to BET*ALPHA*(VXY**1)	0. Eliminates this tail aerodynamic term	$L_{\beta\alpha V_t^2}$	
LAPSVS	a) HLASIM HLAMOR HLAPAY b) INHARO	Tail rolling moment derivative with respect to ALPHA-P * ABS(ALPHA-P) * (VPT**2)	0. Eliminates this tail aerodynamic term	$L_{\alpha\beta V_t^2}$	

Data File ARODTA

VARIABLE NAME	a) PROGRAM(S) b) INPUT SUBROUTINE	DEFINITION	DEFAULT INPUT VALUES	ENGINEERING SYMBOL	CONDITIONS
		Namelist NTPARAH			
LAMTXQ	a) HLASIM HLAMOR HLAPAY b) INHARO	x-Tail arm scale factor for transferring pitching moments	1. Tail aerodynamic moment arm equals tail geometric moment arm for this axis	λ_{xq_t}	
LAMTXR	a) HLASIM HLAMOR HLAPAY b) INHARO	x-tail arm scale factor for transferring yawing moment	1. Tail aerodynamic moment arm equals tail geometric moment arm for this axis	λ_{xr_t}	
LAMTZQ	a) HLASIM HLAMOR HLAPAY b) INHARO	z-tail arm scaling factor for transferring pitching moments	1. Tail aerodynamic moment arm equals tail geometric moment arm for this axis	λ_{zq_t}	
AL1T	a) HLASIM HLAMOR HLAPAY b) INHARO	Tail stall angle of attack - 1 (start of stall transition regime)	0. -- always transition or post-stall regime 1.56 - always linear regime	α_1	$0 \leq \alpha_1 < \alpha_2$
AL2T	a) HLASIM HLAMOR HLAPAY b) INHARO	Tail stall angle of attack - 2 (end of tail transition regime)	0.001 - always post-stall regime 1.57 - always linear or transition regime	α_2	$1.571 \geq \alpha_2 > \alpha_2$
BETA1T	a) HLASIM HLAMOR HLAPAY b) INHARO	Lateral tail stall angle of slideslip - 1 (start of sideslip stall transition regime)	0. - always transition or post-stall regime 1.56 - always linear re[illegible]	β_1	$0 \leq \beta_1 < \beta_2$
BETA2T	a) HLASIM HLAMOR HLAPAY b) INHARO	Stall angle of sideslip - 2 (end of sideslip stall transition regime)	0.001 - Always transiti[illegible] post-stall regime 1.57 - always linear regime	β_2	$1.571 \geq \beta_2 > \beta_1$

Data File ARODTA

VARIABLE NAME	a) PROGRAM(S) b) INPUT SUBROUTINE	DEFINITION	DEFAULT INPUT VALUES	ENGINEERING SYMBOL	CONDITIONS
		Namelist NTPARAH (Concluded)			
ALP1T	a) HLASIM HLAMOR HLAPAY b) INHARO	The rolling stall angle of attack - 1 (start of stall transition regime)	0. - always transition or post-stall regime 1.56 - always linear regime	α_{p1}	$0 \leq \alpha_{p1} < \alpha_{p2}$
ALP2T	a) HLASIM HLAMOR HLAPAY b) INHARO	Tail rolling stall angle of attack - 2 (end of stall regime)	0.001 - always post-stall regime 1.57 - always linear or transition regime	α_{p2}	$1.571 \geq \alpha_{p2} > \alpha_{p1}$
		Namelist NTAUTS			
TAUA	a) HLASIM HLAMOR HLAPAY b) INHARO	Aileron surface deflection effectiveness constants	0. - this tail control is disabled 1 - 100 percent movable tail surface ("flying tail")	τ_a	
TAUE	a) HLASIM HLAMOR HLAPAY b) INHARO	Elevator surface deflection effectiveness constants	0. - this tail control is disabled 1 - 100 percent tail surface ("flying tail")	τ_e	
TAUR	a) HLASIM HLAMOR HLAPAY b) INHARO	Rudder surface deflection effectiveness constants	0. - this tail control is disabled 1 - 100 percent movable tail surface ("flying tail")	τ_r	

Data File TRMDTA

VARIABLE NAME	a) PROGRAM(S) b) INPUT SUBROUTINE	DEFINITION	DEFAULT INPUT VALUES	ENGINEERING SYMBOL	CONDITIONS
Namelist NINSTAT					
VHUL	a) HLASIM HLAPAY b) INSTAT	Velocity of the hull c.g. reference axis in coordinates of the hull c.g. reference axis	0., 0., 0. Hover flight condition	$\underline{V}_h$	
HULPOS	a) HLASIM HLAPAY b) INSTAT	Hull c.g. reference axes inertial position in inertial coordinates	Large negative third component Eliminates all ground effects (e.g., 0., 0, -5000.)	$\underline{R}_I^h$	$\underline{R}_I^h(3) < 0$
HULELR	a) HLASIM HLAPAY b) INSTAT	Euler angle rates of the hull c.g. reference axes with respect to an inertial frame.	0., 0., 0. Rectilinear flight	$\underline{\dot{\eta}}_I^h$	
HULEUL	a) HLASIM HLAPAY b) INSTAT	Euler angles of the hull c.g. reference axes with respect to an inertial frame: PHI, THETA, PSI	0., 0., 0. Level flight	$\underline{\eta}_I^b$	$\eta_I^b(2) \neq \pm \pi/2$

Data File TRMDTA

VARIABLE NAME	a) PROGRAM(S) b) INPUT SUBROUTINE	DEFINITION	DEFAULT INPUT VALUES	ENGINEERING SYMBOL	CONDITIONS
		Namelist NATMOS			
AIRDEN	a) HLASIM HLAMOR HLAPAY b) INATMOS	Reference atmospheric density	0. Eliminates all rotor, propeller, and static buoyancy forces and moments	ρ	
DENRAT	a) HLASIM HLAMOR HLAPAY b) INATMOS	Atmospheric density ratio	0. Eliminates all hull (non-buoyancy), tail, LPU-fuselage, payload aerodynamic forces and moments	σ	
GRAV	a) HLASIM HLAMOR HLAPAY b) INATMOS	Earth's gravitational acceleration magnitude		g	$g \neq 0$
VWIND	a) HLASIM HLAMOR HLAPAY b) INATMOS	Vector of steady wind components in inertial frame coordinates	0., 0., 0 Calm atmosphere	$\underline{V}_I^w$	

Data File TRMDTA

VARIABLE NAME	a) PROGRAM(S) b) INPUT SUBROUTINE	DEFINITION	DEFAULT INPUT VALUES	ENGINEERING SYMBOL	CONDITIONS
		Namelist NSTABDV			
DERVFL	a) HLASIM HLAMOR HLAPAY b) INSTAB	Logical: true equals calculate stability derivatives; false equals do not calculate stability derivatives	F No stability derivative calculations		T or F
AMATFL	a) HLASIM HLAMOR HLAPAY b) INSTAB	System A-matrix stability derivative calculation for flag; true equals calculate system matrix	F No A, A_{aux} stability derivative matrix calculations		T or F
BMATFL	a) HLASIM HLAMOR HLAPAY b) INSTAB	Individual (not linked) control stability derivative calculation flag; true equals calculate individual control derivative matrices	F No B, B_{aux} stability derivative matrix calculations		T or F
BPMTFL	a) HLASIM HLAMOR HLAPAY b) INSTAB	Linked control stability derivative calculation flag, true equals calculate li ed stability matrices	F No B', B'_{aux} stability derivative matrix calculations		T or F
CMATFL	a) HLASIM HLAMOR HLAPAY b) INSTAB	Gust input stability derivative calculation flag; true equals calculate gust derivative matrices	F No C, C_{aux} stability derivative matrix calculations		T or F
CFMTFL	a) HLASIM HLAMOR HLAPAY b) INSTAB	Constraint force stability derivative matrix flag; true equals calculate linearized constraint force equations	F No constraint force (auxiliary) force matrix output		T or F

Data File PLMDTA

VARIABLE NAME	a) PROGRAM(S) b) INPUT SUBROUTINE	DEFINITION	DEFAULT INPUT VALUES	ENGINEERING SYMBOL	CONDITIONS
		Namelist NRTRMSD			
OMEGR1 OMEGR2 OMEGR3 OMEGR4	a) HLASIM HLAPAY b) INPROP	Rotor spin rate	None	Ω_r	$\Omega_r \neq 0$
		Namelist NPTRMSP			
OMEGP1 OMEGP2 OMEGP3 OMEGP4	a) HLASIM HLAPAY b) INPROP	Propeller spin rate	None	Ω_p	$\Omega_p \neq 0$
		Namelist NMECLIM			
THERMX	a) HLASIM HLAPAY b) INMCLC	Maximum rotor collective pitch angle	Large value (e.g., 1.5) This allows full control usage	$(\theta_{o_r})_{max}$	$(\theta_{o_r})_{max} > 0$
A1SRMX	a) HLASIM HLAPAY b) INMCLC	Maximum rotor lateral control axes (swash plate) deflection	Large value (e.g., 1.5) This allows full control usage	$(A_{1s_r})_{max}$	$(A_{1s_r})_{max} > 0$

Data File PLMDTA

VARIABLE NAME	a) PROGRAM(S) b) INPUT SUBROUTINE	DEFINITION	DEFAULT INPUT VALUES	ENGINEERING SYMBOL	CONDITIONS
Namelist NMECLIM (Concluded)					
B1SRMX	a) HLASIM HLAPAY b) INMCLC	Maximum rotor longitudinal control axes (swash plate) deflection	Large value (e.g., 1.5) This allows full control usage	$(B_{1_{s_r}})_{max}$	$(B_{1_{s_r}})_{max} > 0$
THEPMX	a) HLASIM HLAPAY b) INMCLC	Maximum propeller collective pitch angle	Large value (e.g., 1.5) This allows full control usage	$(\theta_{o_p})_{max}$	$(\theta_{o_p})_{max} > 0$
DLALMX	a) HLASIM HLAPAY b) INMCLC	Maximum aileron deflection angle	Large value (e.g., 1.5) This allows full control usage	$(\delta_a)_{max}$	$(\delta_a)_{max} > 0$
DLELMX	a) HLASIM HLAPAY b) INMCLC	Maximum elevator deflection angle	Large value (e.g., 1.5) This allows full control usage	$(\delta_e)_{max}$	$(\delta_e)_{max} > 0$
DLRDMX	a) HLASIM HLAPAY b) INMCLC	Maximum rudder deflection angle	Large value (e.g., 1.5) This allows full control usage	$(\delta_r)_{max}$	$(\delta_r)_{max} > 0$

Data File IFCDTA

VARIABLE NAME	a) PROGRAM(S) b) INPUT SUBROUTINE	DEFINITION	DEFAULT INPUT VALUES	ENGINEERING SYMBOL	CONDITIONS
			Namelist NSHDRCN		
BWK1R1 BWK1R2 BWK1R3 BWK1R4	a) HLASIM HLAMOR HLAPAY b) INRIFC	Beta-wake angle for start of shadow region for rotors		$\beta 1^r$	$0 \leq \beta 1^r < \beta 2^r$
BWK2R1 BWK2R2 BWK2R3 BWK2R4	a) HLASIM HLAMOR HLAPAY b) INRIFC	Beta-wake angle for end of shadow region for rotors		$\beta 2^r$	$6.283 \geq \beta 2^r > \beta 1^r$
MXBDR1 MXBDR2 MXBDR3 MXBDR4	a) HLASIM HLAMOR HLAPAY b) INRIFC	Maximum beta-wake defect for rotors	1. No β-wake velocity defect	$M_{max}(\beta^r)$	
LWK1R1 LWK1R2 LWK1R3 LWK1R4	a) HLASIM HLAMOR HLAPAY b) INRIFC	Lambda-wake angle for start of shadow region for rotors		$\lambda 1^r$	$0 \leq \lambda 1^r < \lambda 2^r$
LWK2R1 LWK2R2 LWK2R3 LWK2R4	a) HLASIM HLAMOR HLAPAY b) INRIFC	Lambda-wake angle for end of shadow region for rotors		$\lambda 2^r$	$6.283 \geq \lambda 2^r > \lambda 1^r$
MXLDR1 MXLDR2 MXLDR3 MXLDR4	a) HLASIM HLAMOR HLAPAY b) INRIFC	Maximum lambda-wake defect for rotors	1. No λ-wake velocity defect	$M_{max}(\lambda^r)$	
			Namelist NKHR		
KHRA1 KHRA2 KHRA3 KHRA4	a) HLASIM HLAMOR HLAPAY b) INRIFC	Hull on rotor interference constants - A	0. No hull wake turbulence interference on rotor	KHRA	
KHRB1 KHRB2 KHRB3 KHRB4	a) HLASIM HLAMOR HLAPAY b) INRIFC	Hull on rotor interference constants - B	0. No hull wake turbulence interference on rotor	KHRB	

Data File IFCDTA

VARIABLE NAME	a) PROGRAM(S) b) INPUT SUBROUTINE	DEFINITION	DEFAULT INPUT VALUES	ENGINEERING SYMBOL	CONDITIONS
		Namelist NKGR			
KGR1 KGR2 KGR3 KGR4	a) HLASIM HLAMOR HLAPAY b) INRIFC	Ground on rotor interference constants	Large negative value (e.g., -99.0) No ground effects on rotor	KGR	KGR ≠ 0
		Namelist NSHDPCN			
BWK1P1 BWK1P2 BWK1P3 BWK1P4	a) HLASIM HLAMOR HLAPAY b) INPIFC	Beta-wake angle for start of shadow region for propellers		$\beta 1^P$	$0 \leq \beta 1^P < \beta 2^P$
BWK2P1 BWK2P2 BWK2P3 BWK2P4	a) HLASIM HLAMOR HLAPAY b) INPIFC	Beta-wake angle for end of shadow region for propellers		$\beta 2^P$	$6.283 \geq \beta 2^P > \beta 1^P$
MXBDP1 MXBDP2 MXBDP3 MXBDP4	a) HLASIM HLAMOR HLAPAY b) INPIFC	Maximum beta-wake defect for propellers	1. No β-wake velocity defect on propeller	$M_{max}(\beta^P)$	
LWK1P1 LWK1P2 LWK1P3 LWK1P4	a) HLASIM HLAMOR HLAPAY b) INPIFC	Lambda-wake angle for start of shadow region for propellers		$\lambda 1^P$	$0 \leq \lambda 1^P < \lambda 2^P$
LWK2P1 LWK2P2 LWK2P3 LWK2P4	a) HLASIM HLAMOR HLAPAY b) INPIFC	Lambda-wake angle for end of shadow region for propellers		$\lambda 2^P$	$6.283 \geq \lambda 2^P > \lambda 1^P$
MXLDP1 MXLDP2 MXLDP3 MXLDP4	a) HLASIM HLAMOR HLAPAY b) INPIFC	Maximum lambda-wake defect for propellers	1. No λ-wake velocity defect on propeller	$M_{max}(\lambda^P)$	

Data File IFCDTA

VARIABLE NAME	a) PROGRAM(S) b) INPUT SUBROUTINE	DEFINITION	DEFAULT INPUT VALUES	ENGINEERING SYMBOL	CONDITIONS
		Namelist NKHP			
KHPA1 KHPA2 KHPA3 KHPA4	a) HLASIM HLAMOR HLAPAY b) INPIFC	Hull on propeller interference constants - A	0. No hull wake turbulence interference on propeller	KHPA	
KHPB1 KHPB2 KHPB3 KHPB4	a) HLASIM HLAMOR HLAPAY b) INPIFC	Hull on propeller interference constants - B	0. No hull wake turbulence interference on propeller	KHPB	
		Namelist KNRP			
KRP1 KRP2 KRP3 KRP4	a) HLASIM HLAMOR HLAPAY b) INPIFC	Rotor on propeller interference constants	0. No rotor on propeller velocity interference	KRP	
		Namelist KNGP			
KGP1 KGP2 KGP3 KGP4	a) HLASIM HLAMOR HLAPAY b) INPIFC	Ground on propeller interference constants	Large negative value (e.g., -99.0) No ground effects on propeller	KGP	KGP ≠ 0

Data File IFCDTA

VARIABLE NAME	a) PROGRAM(S) b) INPUT SUBROUTINE	DEFINITION	DEFAULT INPUT VALUES	ENGINEERING SYMBOL	CONDITIONS
		Namelist NSHDFCN			
BWK1F1 BWK1F2 BWK1F3 BWK1F4	a) HLASIM HLAMOR HLAPAY b) INFIFC	Beta-wake angle for start of shadow region for fuselages		$\beta 1^f$	$0 \leq \beta 1^f < \beta 2^f$
BWK2F1 BWK2F2 BWK2F3 BWK2F4	a) HLASIM HLAMOR HLAPAY b) INFIFC	Beta-wake angle for end of shadow region for fuselages		$\beta 2^f$	$6.283 \geq \beta 2^f > \beta 1^f$
MXBDF1 MXBDF2 MXBDF3 MXBDF4	a) HLASIM HLAMOR HLAPAY b) INFIFC	Maximum beta-wake defect for fuselages	1. No β-wake velocity defect on fuselage	$M_{max}(\beta^f)$	
LWK1F1 LWK1F2 LWK1F3 LWK1F4	a) HLASIM HLAMOR HLAPAY b) INFIFC	Lambda-wake angle for start of shadow region for fuselages		$\lambda 1^f$	$0 \leq \lambda 1^f < \lambda 2^f$
LWK2F1 LWK2F2 LWK2F3 LWK2F4	a) HLASIM HLAMOR HLAPAY b) INFIFC	Lambda-wake angle for end of shadow region for fuselages		$\lambda 2^f$	$6.283 \geq \lambda 2^f > \lambda 1^f$
MXLDF1 MXLDF2 MXLDF3 MXLDF4	a) HLASIM HLAMOR HLAPAY b) INFIFC	Maximum lambda-wake defect for fuselages	1. No λ-wake velocity defect on fuselage	$M_{max}(\lambda^f)$	
		Namelist NKRF			
KRF1 KRF2 KRF3 KRF4	a) HLASIM HLAMOR HLAPAY b) INFIFC	Rotor on fuselage interference constants	0. No rotor on fuselage velocity interference	KRF	

Data File IFCDTA

VARIABLE NAME	a) PROGRAM(S) b) INPUT SUBROUTINE	DEFINITION	DEFAULT INPUT VALUES	ENGINEERING SYMBOL	CONDITIONS
		Namelist NKPF			
KPF1 KPF2 KPF3 KPF4	a) HLASIM HLAMOR HLAPAY b) INFIFC	Propeller on fuselage interference constants	0. No propeller on fuselage velocity interference	KPF	
		Namelist NKGHCN			
KGHA	a) HLASIM HLAMOR HLAPAY b) INHIFC	Ground on hull interference constant - A	Large negative value (e.g., -99.0) No ground on hull velocity interference	KGHA	KGHA ≠ 0
KGHB	a) HLASIM HLAMOR HLAPAY b) INHIFC	Ground on gull interference constant - B	Large negative value (e.g., -99.0) No ground on hull crossflow interference	KGHB	KGHB ≠0
		Namelist NKRH			
KRHA1 KRHA2 KRHA3 KRHA4	a) HLASIM HLAMOR HLAPAY b) INHIFC	Rotor on hull interference constant - A	0. Eliminates linear term in rotor on hull crossflow interference equation	KRHA	
KRHB1 KRHB2 KRHB3 KRHB4	a) HLASIM HLAMOR HLAPAY b) INHIFC	Rotor on hull interference constant - B	0. Eliminates quadratic term in rotor on hull crossflow interference equation	KRHB	
KRHC1 KRHC2 KRHC3 KRHC4	a) HLASIM HLAMOR HLAPAY b) INHIFC	Rotor on hull interference constant - C	0. Eliminates this rotor on hull velocity interference term	KRHC	
KRHD1 KRHD2 KRHD3 KRHD4	a) HLASIM HLAMOR HLAPAY b) INHIFC	Rotor on hull interference constant - D	0. Eliminates this rotor on hull velocity interference term	KRHD	
KRHE1 KRHE2 KRHE3 KRHE4	a) HLASIM HLAMOR HLAPAY b) INHIFC	Rotor on hull interference constant - E	0. Eliminates this rotor on hull velocity interference term	KRHE	

Data File IFCDTA

VARIABLE NAME	a) PROGRAM(S) b) INPUT SUBROUTINE	DEFINITION	DEFAULT INPUT VALUES	ENGINEERING SYMBOL	CONDITIONS
		Namelist NKPH			
KPHA1 KPHA2 KPHA3 KPHA4	a) HLASIM HLAMOR HLAPAY b) INHIFC	Propeller on hull interference constant - A	0. Eliminates linear term in propeller on hull crossflow interference equation	KPHA	
KPHB1 KPHB2 KPHB3 KPHB4	a) HLASIM HLAMOR HLAPAY b) INHIFC	Propeller on hull interference constant - B	0. Eliminates quadratic term in propeller on hull crossflow interference equation	KPHB	
KPHC1 KPHC2 KPHC3 KPHC4	a) HLASIM HLAMOR HLAPAY b) INHIFC	Propeller on hull interference constant - C	0. Eliminates this propeller on hull velocity interference term	KPHC	
KPHD1 KPHD2 KPHD3 KPHD4	a) HLASIM HLAMOR HLAPAY b) INHIFC	Propeller on hull interference constant - D	0. Eliminates this propeller on hull velocity interference term	KPHD	
KPHE1 KPHE2 KPHE3 KPHE4	a) HLASIM HLAMOR HLAPAY b) INHIFC	Propeller on hull interference constant - E	0. Eliminates this propeller on hull velocity interference term	KPHE	
		Namelist NKRT			
KRTA1 KRTA2 KRTA3 KRTA4	a) HLASIM HLAMOR HLAPAY b) INTIFC	Rotor on tail interference constant - A	0. Eliminates this rotor on tail velocity interference term	KRTA	
KRTB1 KRTB2 KRTB3 KRTB4	a) HLASIM HLAMOR HLAPAY b) INTIFC	Rotor on tail interference constant - B	0. Eliminates this rotor on tail velocity interference constant	KRTB	
KRTC1 KRTC2 KRTC3 KRTC4	a) HLASIM HLAMOR HLAPAY b) INTIFC	Rotor on tail interference constant - C	0. Eliminates this rotor on tail velocity interference term	KRTC	

Data File IFCDTA

VARIABLE NAME	a) PROGRAM(S) b) INPUT SUBROUTINE	DEFINITION	DEFAULT INPUT VALUES	ENGINEERING SYMBOL	CONDITIONS
		Namelist NKPT			
KPTA1 KPTA2 KPTA3 KPTA4	a) HLASIM HLAMOR HLAPAY b) INTIFC	Propeller on tail interference constant - A	0. Eliminates this propeller on tail velocity interference term	KPTA	
KPTB1 KPTB2 KPTB3 KPTB4	a) HLASIM HLAMOR HLAPAY b) INTIFC	Propeller on tail interference constant - B	0. Eliminates this propeller on tail velocity interference term	KPTB	
KPTC1 KPTC2 KPTC3 KPTC4	a) HLASIM HLAMOR HLAPAY b) INTIFC	Propeller on tail interference constant - C	0. Eliminates this propeller on tail velocity interference term	KPTC	
		Namelist NKGT			
KGTA	a) HLASIM HLAMOR HLAPAY b) INTIFC	Ground on tail interference constant - A	Large negative value (e.g., -99.0) Eliminates this ground on tail interference effect	KGTA	
KGTB	a) HLASIM HLAMOR HLAPAY b) INTIFC	Ground on tail interference constant - B	Large positive value (e.g., 99.0) Eliminates this ground on tail interference effect	KGTB	

Data File HISDTA

VARIABLE NAME	a) PROGRAM(S) b) INPUT SUBROUTINE	DEFINITION	DEFAULT INPUT VALUES	ENGINEERING SYMBOL	CONDITIONS
Namelist NFCSLIM					
UILM	a) HLASIM HLAPAY b) INFCSC	X-speed circuit integration limit	Large value (e.g., 1.5) allows full integrator usage, without cutoff 0.0 - Eliminates integrator operation	UILM	UILM $\geq$ 0
ULLM	a) HLASIM HLAPAY b) INFCSC	X-speed circuit loop limit	Large value (e.g., 1.5) allows full circuit usage, without cutoff (limiting) 0.0 - Eliminates circuit operation	ULLM	ULLM $\geq$ 0
VILM	a) HLASIM HLAPAY b) INFCSC	Y-speed integration limit	Large value (e.g., 1.5) allows full integrator usage, without cutoff 0.0 - Eliminates integrator operation	VILM	VILM $\geq$ 0
VLLM	a) HLASIM HLAPAY b) INFCSC	Y-speed loop limit	Large value (e.g., 1.5) allows full circuit usage, without cutoff (limiting) 0.0 - eliminates circuit operation	VLLM	VLLM $\geq$ 0
HDTILM	a) HLASIM HLAPAY b) INFCSC	Vertical velocity circuit integrator limit	Large value (e.g., 1.5) allows full integrator usage, without cutoff 0.0 - Eliminates integrator operation	HDTILM	HDTILM $\geq$ 0
HDTLLM	a) HLASIM HLAPAY b) INFCSC	Vertical velocity circuit loop limit	Large value (e.g., 1.5) allows full circuit usage without cutoff (limiting) 0.0 - Eliminates circuit operation	HDTLLM	HDTLLM $\geq$ 0

Data File HISDTA

VARIABLE NAME	a) PROGRAM(S) b) INPUT SUBROUTINE	DEFINITION	DEFAULT INPUT VALUES	ENGINEERING SYMBOL	CONDITIONS
Namelist NFCSLIM (Concluded)					
PHIILM	a) HLASIM HLAPAY b) INFCSC	Roll angle circuit integration limit	Large value (e.g., 1.5) allows full integrator usage, without cutoff 0.0 - Eliminates integrator operation	PHIILM	PHIILM $\geq$ 0
PHILLM	a) HLASIM HLAPAY b) INFCSC	Roll angle circuit loop limit	Large value (e.g., 1.5) allows full circuit usage, without cutoff (limiting) 0.0 - Eliminates circuit operation	PHILLM	PHILLM $\geq$ 0
THEILM	a) HLASIM HLAPAY b) INFCSC	Pitch angle circuit integration limit	Large value (e.g., 1.5) allows full integrator usage, without cutoff 0.0 - Eliminates integrator operation	THEILM	THEILM $\geq$ 0
THELLM	a) HLASIM HLAPAY b) INFCSC	Pitch angle circuit loop limit	Large value (e.g., 1.5) allows full circuit usage, without cutoff (limiting) 0.0 - Eliminates circuit operation	THELLM	THELLM $\geq$ 0
RILM	a) HLASIM HLAPAY b) INFCSC	Turn rate circuit integrator limit	Large value (e.g., 1.5) allows full integrator usage, without cutoff 0.0 - Eliminates integrator operation	RILM	RILM $\geq$ 0
RLLM	a) HLASIM HLAPAY b) INFCSC	Turn rate circuit loop limit	Large value (e.g., 1.5) allows full circuit usage, without cutoff (limiting) 0. - Eliminates circuit operation	RLLM	RLLM $\geq$ 0

Data File HISDTA

VARIABLE NAME	a) PROGRAM(S) b) INPUT SUBROUTINE	DEFINITION	DEFAULT INPUT VALUES	ENGINEERING SYMBOL	CONDITIONS
Namelist NCLOSLP					
ULPFLG	a) HLASIM HLAPAY b) INFCSC	Flight control system flag indicating U loop is closed	F - This flight control system circuit is disconnected		T or F
VLPFLG	a) HLASIM HLAPAY b) INFCSC	Flight control system flag indicating V loop is closed	F - This flight control system circuit is disconnected		T or F
HDTLPF	a) HLASIM HLAPAY b) INFCSC	Flight control system flag indicating HDOT loop is closed	F - This flight control system circuit is disconnected		T or F
PLPFLG	a) HLASIM HLAPAY b) INFCSC	Flight control system flag indicating P loop is closed	F - This flight control system circuit is disconnected		T or F
QLPFLG	a) HLASIM HLAPAY b) INFCSC	Flight control system flag indicating Q loop is closed	F - This flight control system circuit is disconnected		T or F
TRTLPF	a) HLASIM HLAPAY b) INFCSC	Flight control system flag indicating turn rate loop is closed	F - This flight control system circuit is disconnected		T or F

Data File HISDTA

VARIABLE NAME	a) PROGRAM(S) b) INPUT SUBROUTINE	DEFINITION	DEFAULT INPUT VALUES	ENGINEERING SYMBOL	CONDITIONS
		Namelist NFDBKFL			
UFDBK	a) HLASIM HLAPAY b) INFCSC	Feedback flag: true equals hull body axis x-velocity feedback, false equals hull x-velocity sensor feedback	T - Hull c.g. body axis kinematic feedback quantity		T or F
VFDBK	a) HLASIM HLAPAY b) INFCSC	Feedback flag: true equals hull c.g. body axis y-velocity feedback, false equals hull y-velocity sensor feedback	T - Hull c.g. body axis kinematic feedback quantity		T or F
RFDBK	a) HLASIM HLAPAY b) INFCSC	Feedback flag: true equals hull c.g. body axis yaw rate feedback false equals hull c.g. axis Euler yaw rate (PSIDOT) feedback	T - Hull c.g. body axis kinematic feedback quantity		T or F
		Namelist NFCSGNS			
KUSPED	a) HLASIM HLAPAY b) INFCSC	Forward speed circuit proportional gain	0.0 Gain is eliminated	K_u	
KIU	a) HLASIM HLAPAY b) INFCSC	Forward speed circuit integrator gain	0.0 Gain is eliminated	K_{Iu}	
TAXAC	a) HLASIM HLAPAY b) INFCSC	x-accelerometer gain	0.0 Gain is eliminated	$T_{\dot{u}_{ac}}$	

Data File HISDTA

VARIABLE NAME	a) PROGRAM(S) b) INPUT SUBROUTINE	DEFINITION	DEFAULT INPUT VALUES	ENGINEERING SYMBOL	CONDITIONS
Namelist NFCSGNS (Continued)					
KVSPED	a) HLASIM HLAPAY b) INFCSC	Lateral velocity circuit proportional gain	0.0 Gain is eliminated	K_v	
KIV	a) HLASIM HLAPAY b) INFCSC	Lateral velocity circuit integrator gain	0.0 Gain is eliminated	K_{Iv}	
TAYAC	a) HLASIM HLAPAY b) INFCSC	y-accelerometer gain	0.0 Gain is eliminated	$T\dot{v}_{ac}$	
KHDOT	a) HLASIM HLAPAY b) INFCSC	Vertical velocity circuit proportional gain	0.0 Gain is eliminated	$K_{\dot{h}}$	
KHIDOT	a) HLASIM HLAPAY b) INFCSC	Vertical velocity circuit integrator gain	0.0 Gain is eliminated	K_{Ih}	
TAZAC	a) HLASIM HLAPAY b) INFCSC	z-accelerometer gain	0.0 Gain is eliminated	$T\dot{w}_{ac}$	
KPHI	a) HLASIM HLAPAY b) INFCSC	Roll angle circuit proportion gain	0.0 Gain is eliminated	K_ϕ	

Data File HISDTA

VARIABLE NAME	a) PROGRAM(S) b) INPUT SUBROUTINE	DEFINITION	DEFAULT INPUT VALUES	ENGINEERING SYMBOL	CONDITIONS
Namelist HFCSCHS (Concluded)					
KIPHI	a) HLASIM HLAPAY b) IHFCSC	Roll angle circuit integrator gain	0.0 Gain is eliminated	$K_{I\phi}$	
TROLRT	a) HLASIM HLAPAY b) IHFCSC	Roll rate gain	0.0 Gain is eliminated	T_p	
KTHETA	a) HLASIM HLAPAY b) IHFCSC	Pitch angle circuit proportional gain	0.0 Gain is eliminated	K_θ	
KITHET	a) HLASIM HLAPAY b) IHFCSC	Pitch angle circuit integrator gain	0.0 Gain is eliminated	$K_{I\theta}$	
TPTHET	a) HLASIM HLAPAY b) IHFCSC	Pitch rate gain	0.0 Gain is eliminated	T_q	
KTRAT	a) HLASIM HLAPAY b) IHFCSC	Turn rate circuit proportional gain	0.0 Gain is eliminated	$K_{\dot{\psi}}$	
KIR	a) HLASIM HLAPAY b) IHFCSC	Yaw rate circuit integrator gain	0.0 Gain is eliminated	$K_{I\dot{\psi}}$	

Data File HISDTA

VARIABLE NAME	a) PROGRAM(S) b) INPUT SUBROUTINE	DEFINITION	DEFAULT INPUT VALUES	ENGINEERING SYMBOL	CONDITIONS
Namelist NPOSHCS					
POSHT1	a) HLASIM HLAPAY b) INFCSC	Hover position hold starting time	POSHT1 > TSIM Position Hold System is not activated		$0 \leq$ POSHT1 < POSHT2
POSHT2	a) HLASIM HLAPAY b) INFCSC	Hover position hold ending time	POSHT2 > TSIM Command issued at POSHT1 is held on for the duration of the time history		POSHT2 > POSHT1
KX	a) HLASIM HLAPAY b) INFCSC	Forward location hold circuit proportional gain	0. Gain is eliminated	K_x	
KY	a) HLASIM HLAPAY b) INFCSC	Lateral position hold circuit proportional gain	0. Gain is eliminated	K_y	
KH	a) HLASIM HLAPAY b) INFCSC	Vertical height hold circuit proportional gain	0. Gain is eliminated	K_h	
KPSI	a) HLASIM HLAPAY b) INFCSC	Heading angle hold proportional gain	0. Gain is eliminated	K_ψ	

Data File HISDTA

VARIABLE NAME	a) PROGRAM(S) b) INPUT SUBROUTINE	DEFINITION	DEFAULT INPUT VALUES	ENGINEERING SYMBOL	CONDITIONS
		Namelist NRSENSR			
RACELC	a) HLASIM HLAPAY b) INFCSC	Relative accelerometer location	0., 0., 0. Accelerometer axes are coincident with hull center of volume reference axes	$\underline{R}_{hac}^{hac}$	
RVSNLC	a) HLASIM HLAPAY b) INFCSC	Relative velocity sensor location	0., 0., 0. Airspeed sensor axes are coincident with hull center of volume reference axes	$\underline{R}_{hac}^{hac}$	
		Namelist NRSWASH			
RTCOM1	a) HLASIM HLAPAY b) INPROF	Starting time for rotor control commands	RTCOM $\geq$ TSIM No test command is issued	$t1_r$	$0 \leq t1_r < t2_r$
RTCOM2	a) HLASIM HLAPAY b) INPROF	Ending time for rotor control commands	RTCOM2 $\geq$ TSIM Test command issued at RTCOM is held on for the duration of the time history	$t2_r$	$t2_r > t1_r$
DTHER1 DTHER2 DTHER3 DTHER4	a) HLASIM HLAPAY b) INPROF	Commanded rotor collective pitch increment	0. No test command increment is applied	$\Delta\theta_{0_r}$	
DA1SR1 DA1SR2 DA1SR3 DA1SR4	a) HLASIM HLAPAY b) INPROF	Commanded rotor lateral cyclic deflection increment	0. No test command increment is applied	ΔA_{1s_r}	
DB1SR1 DB1SR2 DB1SR3 DB1SR4	a) HLASIM HLAPAY b) INPROF	Commanded rotor longitudinal cyclic deflection increment	0. No test command increment is applied	ΔB_{1s_r}	

Data File HISDTA

VARIABLE NAME	a) PROGRAM(S) b) INPUT SUBROUTINE	DEFINITION	DEFAULT INPUT VALUES	ENGINEERING SYMBOL	CONDITIONS
		Namelist NPFETHR			
PTCOM1	a) HLASIM HLAPAY b) INPROF	Starting time for propeller control commands	PTCOM1 $\geq$ TSIM No test command is issued	$t1_p$	$0 \leq t1_p < t2_p$
PTCOM2	a) HLASIM HLAPAY b) INPROF	Ending time for propeller control commands	PTCOM2 $\geq$ TSIM Test command issued at PTCOM1 is held on for the duration of the time history	$t2_p$	$t2_p > t1_p$
DTHEP1 DTHEP2 DTHEP3 DTHEP4	a) HLASIM HLAPAY b) INPROF	Commanded propeller collective pitch increment	0.0 No test command increment is applied	$\Delta\theta_{o_p}$	
		Namelist NLNKCOM			
LKTCM1	a) HLASIM HLAPAY b) INPROF	Starting time for linked control commands	LKTCM1 $\geq$ TSIM No test command is issued	$t1_{\ell c}$	$0 \leq t1_{\ell c} < t2_{\ell c}$
LKTCM2	a) HLASIM HLAPAY b) INPROF	Ending time for linked control commands	LKTCM2 $\geq$ TSIM Test command issued at LKTCM1 is held on for the duration of the time history	$t2_{\ell c}$	$t2_{\ell c} > t1_{\ell c}$
DUDCNL	a) HLASIM HLAPAY b) INPROF	Axial force control command increment	0.0 No test command increment is applied	Δu_c	

Data File HISDTA

VARIABLE NAME	a) PROGRAM(S) b) INPUT SUBROUTINE	DEFINITION	DEFAULT INPUT VALUES	ENGINEERING SYMBOL	CONDITIONS
Namelist NLNKCOM (Concluded)					
DVDCNL	a) HLASIM HLAPAY b) INPROF	Side force control command increment	0.0 No test command increment is applied	$\Delta\dot{v}_c$	
DWDCNL	a) HLASIM HLAPAY b) INPROF	Vertical force control command increment, positive downward	0.0 No test command increment is applied	$\Delta\dot{w}_c$	
DPCNTL	a) HLASIM HLAPAY b) INPROF	Roll control command increment	0.0 No test command increment is applied	$\Delta\dot{p}_c$	
DQCNTL	a) HLASIM HLAPAY b) INPROF	Yaw control command increment	0.0 No test command increment is applied	$\Delta\dot{q}_c$	
DRCNTL	a) HLASIM HLAPAY b) INPROF	Yaw control command increment	0.0 No test command increment is applied	$\Delta\dot{r}_c$	

Data File HISDTA

VARIABLE NAME	a) PROGRAM(S) b) INPUT SUBROUTINE	DEFINITION	DEFAULT INPUT VALUES	ENGINEERING SYMBOL	CONDITIONS
Namelist NTDEFLC					
TTCOM1	a) HLASIM HLAPAY b) INPROF	Starting time for tail surface deflection commands	TTCOM1 $\geq$ TSIM No test command is issued	$t1_t$	$0 \leq t1_t < t2_t$
TTCOM2	a) HLASIM HLAPAY b) INPROF	Ending time for tail surface deflection commands	TTCOM2 $\geq$ TSIM Test command applied at TTCOM1 is held on for duration of time history	$t2_t$	$t2_t > t1_t$
DDLTAL	a) HLASIM HLAPAY b) INPROF	Aileron test command increment	0. No test command increment is applied	$\Delta\delta_a$	
DDLTEL	a) HLASIM HLAPAY b) INPROF	Elevator test command increment	0. No test command increment is applied	$\Delta\delta_e$	
DDLTRD	a) HLASIM HLAPAY b) INPROF	Rudder test command increment	0. No test command increment is applied	$\Delta\delta_r$	

Data File HISDTA

VARIABLE NAME	a) PROGRAM(S) b) INPUT SUBROUTINE	DEFINITION	DEFAULT INPUT VALUES	ENGINEERING SYMBOL	CONDITIONS
Namelist NCOMMAND					
UCMD	a) HLASIM HLAPAY b) INPROP	Forward velocity command table	Removal from data list will cause trim control deflections to be maintained for this axis during the time history	u_{com}	
VCMD	a) HLASIM HLAPAY b) INPROF	Side velocity (y-axis) command table	Removal from data list will cause trim control deflections to be maintained for this axis during the time history	v_{com}	
HDTCMD	a) HLASIM HLAPAY b) INPROF	Vertical velocity command table	Removal from data list will cause trim control deflections to be maintained for this axis during the time history	$\dot{h}_{com}$	
PHICMD	a) HLASIM HLAPAY b) INPROF	Roll angle command table	Removal from data list will cause trim control deflections to be maintained for this axis during the time history	ϕ_{com}	
THECMD	a) HLASIM HLAPAY b) INPROF	Pitch angle command table	Removal from data list will cause trim control deflections to be maintained for this axis during the time history	θ_{com}	
TRTCMD	a) HLASIM HLAPAY b) INPROF	Turn rate command table	Removal from data list will cause trim control deflections to be maintained for this axis during the time history	$\dot{\psi}_{com}$	

Data File HISDTA

VARIABLE NAME	a) PROGRAM(S) b) INPUT SUBROUTINE	DEFINITION	DEFAULT INPUT VALUES	ENGINEERING SYMBOL	CONDITIONS
Namelist NHGCOM					
HT1GST	a) HLASIM HLAMOR HLAPAY b) INGUST	Starting time for hull gust commands	HT1GST $\geq$ TSIM No (1 - cosine) gust commands are issued for this element	T1	$0 \leq$ HT1GST $<$ HT2GST
HT2GST	a) HLASIM HLAMOR HLAPAY b) INGUST	Ending time for hull gust commands		T2	HT2GST > HT1GST
UHGMAX	a) HLASIM HLAMOR HLAPAY b) INGUST	The maximum gust velocity acting at the hull center of volume in the x direction	0.0 No (1 - cosine) disturbance is applied for this gust variable	g_{max}	
VHGMAX	a) HLASIM HLAMOR HLAPAY b) INGUST	The maximum gust velocity acting at the hull center of volume in the y direction	0.0 No (1 - cosine) disturbance is applied for this gust variable	g_{max}	
WHGMAX	a) HLASIM HLAMOR HLAPAY b) INGUST	The maximum gust velocity acting at the hull center of volume in the z direction	0.0 No (1 - cosine) disturbance is applied for this gust variable	g_{max}	
PHGMAX	a) HLASIM HLAMOR HLAPAY b) INGUST	The maximum gust rolling velocity, acting on the hull center of volume	0.0 No (1 - cosine) disturbance is applied for this gust variable	g_{max}	

Data File HISDTA

VARIABLE NAME	a) PROGRAM(S) b) INPUT SUBROUTINE	DEFINITION	DEFAULT INPUT VALUES	ENGINEERING SYMBOL	CONDITIONS
Namelist NHGCOM (Concluded)					
QHGMAX	a) HLASIM HLAMOR HLAPAY b) INGUST	The maximum gust pitching velocity acting at the hull center of volume	0.0 No (1 - cosine) disturbance is applied for this gust variable	g_{max}	
RHGMAX	a) HLASIM HLAMOR HLAPAY b) INGUST	The maximum gust yawing velocity, acting at the hull center of volume	0.0 No (1 - cosine) disturbance is applied for this gust variable	g_{max}	
DUXHMX	a) HLASIM HLAMOR HLAPAY b) INGUST	Maximum commanded rate of change of axial hull-gust velocity, with respect to axial location	0.0 No (1 - cosine) disturbance is applied for this gust variable	g_{max}	
DUYHMX	a) HLASIM HLAMOR HLAPAY b) INGUST	Maximum commanded rate of change of axial hull-gust velocity, with respect to lateral position	0.0 No (1 - cosine) disturbance is applied for this gust variable	g_{max}	
DVYHMX	a) HLASIM HLAMOR HLAPAY b) INGUST	Maximum commanded rate of change of lateral hull-gust velocity, with respect to lateral position	0.0 No (1 - cosine) disturbance is applied for this gust variable	g_{max}	

Data File HISDTA

VARIABLE NAME	a) PROGRAM(S) b) INPUT SUBROUTINE	DEFINITION	DEFAULT INPUT VALUES	ENGINEERING SYMBOL	CONDITIONS
Namelist NTGCOM					
TT1GST	a) HLASIM HLAMOR HLAPAY b) INGUST	The starting time for the gust acting at the tail centroid	TT1GST $\geq$ TSIM No (1 - cosine) gust commands are issued for this element	T1	0 $\leq$ TT1GST < TT2GST
TT2GST	a) HLASIM HLAMOR HLAPAY b) INGUST	The ending time for the gust acting at the tail centroid		T2	TT2GST > TT1GST
UTGMAX	a) HLASIM HLAMOR HLAPAY b) INGUST	The maximum gust velocity acting at the tail centroid in the x direction	0.0 No (1 - cosine) disturbance is applied for this gust variable	g_{max}	
VTGMAY	a) HLASIM HLAMOR HLAPAY b) INGUST	The maximum gust velocity acting at the tail centroid in the y direction	0.0 No (1 - cosine) disturbance is applied for this gust variable	g_{max}	
WTGMAX	a) HLASIM HLAMOR HLAPAY b) INGUST	The maximum gust velocity acting at the tail centroid in the z direction	0.0 No (1 - cosine) disturbance is applied for this gust variable	g_{max}	

Data File HISDTA

VARIABLE NAME	a) PROGRAM(S) b) INPUT SUBROUTINE	DEFINITION	DEFAULT INPUT VALUES	ENGINEERING SYMBOL	CONDITIONS
Namelist NTGCOM (Continued)					
PTGMAX	a) HLASIM HLAMOR HLAPAY b) INGUST	The maximum gust rolling velocity, acting at the tail centroid	0.0 No (1 - cosine) disturbance is applied for this gust variable	g_{max}	
QTGMAX	a) HLASIM HLAMOR HLAPAY b) INGUST	The maximum gust pitching velocity, acting at the tail centroid	0.0 No (1 - cosine) disturbance is applied for this gust variable	g_{max}	
RTGMAX	a) HLASIM HLAMOR HLAPAY b) INGUST	The maximum gust yawing velocity, acting at the tail centroid	0.0 No (1 - cosine) disturbance is applied for this gust variable	g_{max}	
DUXTMX	a) HLASIM HLAMOR HLAPAY b) INGUST	Maximum commanded rate of change of axial tail-gust velocity, with respect to axial position	0.0 No (1 - cosine) disturbance is applied for this gust variable	g_{max}	
DUYTMX	a) HLASIM HLAMOR HLAPAY b) INGUST	Maximum commanded rate of change of axial tail-gust velocity, with respect to lateral position	0.0 No (1 - cosine) disturbance is applied for this gust variable	g_{max}	
DVYTMX	a) HLASIM HLAMOR HLAPAY b) INGUST	Maximum commanded rate of change of lateral tail-gust velocity, with respect to lateral position	0.0 No (1 - cosine) disturbance is applied for this gust variable	g_{max}	

Data File HISDTA

VARIABLE NAME	a) PROGRAM(S) b) INPUT SUBROUTINE	DEFINITION	DEFAULT INPUT VALUES	ENGINEERING SYMBOL	CONDITIONS
		Namelist NLPGCOM			
L1T1GT	a) HLASIM HLAMOR HLAPAY b) INGUST	Starting time for LPU-1 gust commands	L1T1GT $\geq$ TSIM No (1 - cosine) gust commands are issued for this element	T1	0 $\leq$ L1T1GT < L1T2GT
L1T2GT	a) HLASIM HLAMOR HLAPAY b) INGUST	Ending time for LPU-1 gust commands		T2	L1T2GT > L1T1GT
UL1GMX	a) HLASIM HLAMOR HLAPAY b) INGUST	Maximum gust velocity acting on LPU-1 in the x-LPU body axes direction	0.0 No (1 - cosine) disturbance is applied for this gust variable	g_{max}	
VL1GMX	a) HLASIM HLAMOR HLAPAY b) INGUST	Maximum gust velocity acting on LPU-1 in the y-LPU body axes direction	0.0 No (1 - cosine) disturbance is applied for this gust variable	g_{max}	
WL1GMX	a) HLASIM HLAMOR HLAPAY b) INGUST	Maximum gust velocity acting on LPU-1 in the z-LPU body axes direction	0.0 No (1 - cosine) disturbance is applied for this gust variable	g_{max}	

Data File HISDTA

VARIABLE NAME	a) PROGRAM(S) b) INPUT SUBROUTINE	DEFINITION	DEFAULT INPUT VALUES	ENGINEERING SYMBOL	CONDITIONS
		Namelist NLPGCOM (Continued)			
L2T1GT	a) HLASIM HLAMOR HLAPAY b) INGUST	Starting time for LPU-1 gust commands	L2T1GT $\geq$ TSIM No (1 - cosine) gust commands are issued for this element	T1	$0 \leq$ L2T1GT $<$ L2T2GT
L2T2GT	a) HLASIM HLAMOR HLAPAY b) INGUST	Ending time for LPU-2 gust commands		T2	L2T2GT > L2T1GT
UL2GMX	a) HLASIM HLAMOR HLAPAY b) INGUST	Maximum gust velocity acting on LPU-2 in the x-LPU body axes direction	0.0 No (1 - cosine) disturbance is applied for this gust variable	g_{max}	
VL2GMX	a) HLASIM HLAMOR HLAPAY b) INGUST	Maximum gust velocity acting on LPU-2 in the y-LPU body axes direction	0.0 No (1 - cosine) disturbance is applied for this gust variable	g_{max}	
WL2GMX	a) HLASIM HLAMOR HLAPAY b) INGUST	Maximum gust velocity acting on LPU-2 in the z-LPU body axes direction	0.0 No (1 - cosine) disturbance is applied for this gust variable	g_{max}	

Data File HISDTA

VARIABLE NAME	a) PROGRAM(S) b) INPUT SUBROUTINE	DEFINITION	DEFAULT INPUT VALUES	ENGINEERING SYMBOL	CONDITIONS
		Namelist NLPGCOM (Continued)			
L3T1GT	a) HLASIM HLAMOR HLAPAY b) INGUST	Starting time for LPU-3 gust commands	L3T1GT $\geq$ TSIM No (1 - cosine) gust commands are issued for this elements	T1	$0 \leq$ L3T1GT $<$ L3T2GT
L3T2GT	a) HLASIM HLAMOR HLAPAY b) INGUST	Ending time for LPU-3 gust commands		T2	L3T2GT > L3T1GT
UL3GMX	a) HLASIM HLAMOR HLAPAY b) INGUST	Maximum gust velocity acting on LPU-3 in the x-LPU body axes direction	0.0 No (1 - cosine) disturbance is applied for this gust variable	g_{max}	
VL3GMX	a) HLASIM HLAMOR HLAPAY b) INGUST	Maximum gust velocity acting on LPU-3 in the y-LPU body axes direction	0.0 No (1 - cosine) disturbance is applied for this gust variable	g_{max}	
WL3TMX	a) HLASIM HLAMOR HLAPAY b) INGUST	Maximum gust velocity acting on LPU-3 in the z-LPU body axes direction	0.0 No (1 - cosine) disturbance is applied for this gust variable	g_{max}	

Data File HISDTA

VARIABLE NAME	a) PROGRAM(S) b) INPUT SUBROUTINE	DEFINITION	DEFAULT INPUT VALUES	ENGINEERING SYMBOL	CONDITIONS
Namelist NLPGCOM (Concluded)					
L4T1GT	a) HLASIM HLAMOR HLAPAY b) INGUST	Starting time for LPU-4 gust commands	0.0 No (1 - cosine) disturbance is applied for this gust variable	T1	
L4T2GT	a) HLASIM HLAMOR HLAPAY b) INGUST	Ending time for LPU-4 gust commands	0.0 No (1 - cosine) disturbance is applied for this gust variable	T2	
UL4GMX	a) HLASIM HLAMOR HLAPAY b) INGUST	Maximum gust velocity acting on LPU-4 in the x-LPU body axes direction	0.0 No (1 - cosine) disturbance is applied for this gust variable	g_{max}	
VL4GMX	a) HLASIM HLAMOR HLAPAY b) INGUST	Maximum gust velocity acting on LPU-4 in the y-LPU body axes direction	0.0 No (1 - cosine) disturbance is applied for this gust variable	g_{max}	
WL4GMX	a) HLASIM HLAMOR HLAPAY b) INGUST	Maximum gust velocity acting on LPU-4 in the z-LPU body axes direction	0.0 No (1 - cosine) disturbance is applied for this gust variable	g_{max}	

Data File HISDTA

VARIABLE NAME	a) PROGRAM(S) b) INPUT SUBROUTINE	DEFINITION	DEFAULT INPUT VALUES	ENGINEERING SYMBOL	CONDITIONS
		Namelist NGSTRNG			
GSTFLG	a) HLASIM HLAMOR HLAPAY b) INGUST	Logical flag: true equals gust string inputs desired; false equals gust string inputs not desired	F No (vehicle) gust input string data is necessary		T or F
GSTSCF	a) HLASIM HLAMOR HLAPAY b) INGUST	Scale factor for gust string inputs	1. Vehicle gust input string data is used uncorrected in the simulation	M_h	
		Namelist NRSRCLC			
RFSRCX	a) HLASIM HLAMOR HLAPAY b) INGUST	Locates the forward gust input source location with respect to the hull center of volume reference axis		R_x^f	$R_x^f \neq R_x^a$
RASRCX	a) HLASIM HLAMOR HLAPAY b) INGUST	Locates the aft gust input source slip locations with respect to the hull center of volume reference axis		R_x^a	$R_x^a \neq R_x^f$
RSORCY	a) HLASIM HLAMOR HLAPAY b) INGUST	Locates the lateral (symmetric about the x-axis) position of the gust input sources; this value must be positive		R_y^t	$R_y^t > 0$

Data File HLDTA

VARIABLE NAME	a) PROGRAM(S) b) INPUT SUBROUTINE	DEFINITION	DEFAULT INPUT VALUES	ENGINEERING SYMBOL	CONDITIONS
		Namelist MINSTEP			
TIMSTP	a) HLASIM HLAMOR HLAPAY b) INSTEP	Numerical integration maximum time step			TIMSTP > 0
MINSTP	a) HLASIM HLAMOR HLAPAY b) INSTEP	Minimum time step allowed for the program integrator to provide the user a means of controlling run time and cost			MINSTP > 0
TPRINT	a) HLASIM HLAMOR HLAPAY b) INSTEP	Output print interval			TPRINT > 0 (Recommend to be a multiple of TIMSTP)
TSIM	a) HLASIM HLAMOR HLAPAY b) INSTEP	Total six degree of freedom simulation time			TSIM > 0

Data File PAYDTA

VARIABLE NAME	a) PROGRAM(S) b) INPUT SUBROUTINE	DEFINITION	DEFAULT INPUT VALUES	ENGINEERING SYMBOL	CONDITIONS
Namelist NPAYLOD					
PAYLTH	a) HLAPAY b) INPGEO	Payload reference length	Not used		
PAYDTH	a) HLAPAY b) INPGEO	Payload depth	Not used		
PAYVOL	a) HLAPAY b) INPGEO	Payload volume	Not used		
PAYARA	a) HLAPAY b) INPGEO	Payload front projected area (reference area)	Not used		
PAYID	a) HLAPAY b) INPGEO	Payload configuration identifier	Not used		
Namelist NRPTCH					
RPTCH1 RPTCH2 RPTCH3 RPTCH4	a) HLAPAY b) INPGEO	Four vectors locating the cable attach points on the payload with respect to the payload reference center in coordinates of payload reference axis		$\underline{R}_{ppc}^{pk}$	
Namelist NRATHP					
RATHP1 RATHP2 RATHP3 RATHP4	a) HLAPAY b) INPGEO	Four vectors locating each cable attach point on the hull, with respect to the hull center of volume in coordinates of the hull center of volume reference axis		$\underline{R}_{hcv}^{hj}$	
Namelist NUSCLTH					
USLTH1 USLTH2 USLTH3 USLTH4	a) HLAPAY b) INPGEO	Cable unstretched lengths		$\ell_{o_{jk}}$	$\ell_{o_{jk}} > 0$

Data File PAYDTA

VARIABLE NAME	a) PROGRAM(S) b) INPUT SUBROUTINE	DEFINITION	DEFAULT INPUT VALUES	ENGINEERING SYMBOL	CONDITIONS
			Namelist NRPAYCG		
RPAYCG	a) HLAPAY b) INPMAS	Vector locating the center of gravity with respect to the payload reference center in coordinates of the reference center axis	0. Payload center of gravity is coincident with payload aerodynamic reference center	$\underline{R}^{p}_{ppc}$	
			Namelist NMASPAY		
MASPAY	a) HLAPAY b) INPMAS	Mass of the payload		m_p	$m_p > 0$
IPAYXX	a) HLAPAY b) INPMAS	Payload moment of inertia about the payload c.g. x-axis		I_{xx_p}	$I_{xx_p} > 0$
IPAYYY	a) HLAPAY b) INPMAS	Payload moment of inertia about the payload c.g. y-axis		I_{yy_p}	$I_{yy_p} > 0$
IPAYXZ	a) HLAPAY b) INPMAS	Payload product of inertia with respect to the payload c.g. xz-axis		I_{xz_p}	
			Namelist NCABLK		
CABLK1 CABLK2 CABLK3 CABLK4	a) HLAPAY b) INCABL	Cable spring constants	0. This payload cable is disabled	K_c	$K_c \geq 0$
			Namelist NCABLC		
CABLC1 CABLC2 CABLC3 CABLC4	a) HLAPAY b) INCABL	Cable damping constants	0. No viscous spring damping in this cable	C_c	$C_c \geq 0$

Data File PAYDTA

VARIABLE NAME	a) PROGRAM(S) b) INPUT SUBROUTINE	DEFINITION	DEFAULT INPUT VALUES	ENGINEERING SYMBOL	CONDITIONS
Namelist NPDRUS					
XUUABP	a) HLAPAY b) INPARO	Payload x-force derivative with respect to U*ABS(U)	0. Eliminates this payload aerodynamic term	$X_{u\|u\|_p}$	
YVVABP	a) HLAPAY b) INPARO	Payload y-force derivative with respect to V*ABS(V)	0. Eliminates this payload aerodynamic term	$Y_{v\|v\|_p}$	
ZWWABP	a) HLAPAY b) INPARO	Payload z-force derivative with respect to W*ABS(W)	0. Eliminates this payload aerodynamic term	$Z_{w\|w\|_p}$	
NUVP	a) HLAPAY b) INPARO	Payload rolling moment derivative with respect to U*ABS(W)	0. Eliminates this payload aerodynamic term	N_{uv_p}	
LPPABP	a) HLAPAY b) INPARO	Payload rolling moment with respect to P*ABS(P)	0. Eliminates this payload aerodynamic term	$L_{p\|p\|_p}$	
MQQABP	a) HLAPAY b) INPARO	Payload pitching moment derivative with respect to Q*ABS(Q)	0. Eliminates this payload aerodynamic term	$M_{q\|q\|_p}$	
NRRABP	a) HLAPAY b) INPARO	Payload yawing derivative with respect to R*ABS(R)	0. Eliminates this payload aerodynamic term	$N_{r\|r\|_p}$	

Data File PAYDTA

VARIABLE NAME	a) PROGRAM(S) b) INPUT SUBROUTINE	DEFINITION	DEFAULT INPUT VALUES	ENGINEERING SYMBOL	CONDITIONS
		Namelist NINDPST			
DVPYLD	a) HLAPAY b) INPYST	Payload velocity increments	0. No time history perturbation on this payload vector	$\Delta \underline{V}_p$	
DHRPYL	a) HLAPAY b) INPYST	Payload location increments	0. No time history perturbation on this payload vector	$\Delta \underline{R}_h^p$	
DPYELR	a) HLAPAY b) INPYST	Payload Euler rate increments	0. No time history perturbation on this payload vector	$\Delta \dot{\underline{\eta}}_K^p$	
DPYEUL	a) HLAPAY b) INPYST	Payload Euler angle increments	0. No time history perturbation on this payload vector	$\Delta \underline{\eta}_I^p$	
		Namelist NPYGCOM			
PYT1GT	a) HLAPAY b) INPGST	Starting time for payload (1 - cosine gust)	PYT1GT $\geq$ TSIM No (1 - cosine) gust commands are issued for this element	T1	$0 \leq$ PYT1GT $<$ PYT2GT
PYT2GT	a) HLAPAY b) INPGST	Ending time for payload (1 - cosine gust)		T2	PYT2GT $>$ PYT1GT
UPYGMX	a) HLAPAY b) INPGST	Maximum payload axial gust velocity (1 - cosine shape)	0.0 No (1 - cosine) disturbance is applied for this gust variable	g_{max}	
VPYGMX	a) HLAPAY b) INPGST	Maximum value of payload side gust (1 - cosine shape)	0.0 No (1 - cosine) disturbance is applied for this gust variable	g_{max}	

Data File PAYDTA

VARIABLE NAME	a) PROGRAM(S) b) INPUT SUBROUTINE	DEFINITION	DEFAULT INPUT VALUES	ENGINEERING SYMBOL	CONDITIONS
Namelist NPYGCOM (Concluded)					
WPYGMX	a) HLAPAY b) INPGST	Maximum payload downward gust (1 - cosine shape)	0.0 No (1 - cosine) disturbance is applied for this gust variable	g_{max}	
PPYGMX	a) HLAPAY b) INPGST	Maximum payload rolling gust (1 - cosine shape)	0.0 No (1 - cosine) disturbance is applied for this gust variable	g_{max}	
QPYGMX	a) HLAPAY b) INPGST	Payload maximum pitching gust (1 - cosine shape)	0.0 No (1 - cosine) disturbance is applied for this gust variable	g_{max}	
RPYGMX	a) HLAPAY b) INPGST	Maximum value of payload yawing gust (1 - cosine shape)	0.0 No (1 - cosine) disturbance is applied for this gust variable	g_{max}	
Namelist NPGSTRN					
PGSTFL	a) HLAPAY b) INPGST	T/F, a flag indicating that random gusts are to be turned on	F No gust payload input string data is necessary		T or F
PVGSCF	a) HLAPAY b) INPGST	A scale factor to be applied to the random gust velocities on input	1. Payload (linear) gust input string data is used uncorrected	M_{v_p}	
POGSCF	a) HLAPAY b) INPGST	A scale factor to be applied to the random gust angular velocities on input	1. Payload (angular) gust input string data is used uncorrected	M_{w_p}	

Data File MORDTA

VARIABLE NAME	a) PROGRAM(S) b) INPUT SUBROUTINE	DEFINITION	DEFAULT INPUT VALUES	ENGINEERING SYMBOL	CONDITIONS
		Namelist NCALMHD			
PSIO	a) HLAMOR b) INMTRA	Heading angle with respect to the inertial frame of the moored vehicle with no inertial wind, or initial heading angle off of the steady wind for trim algorithm initialization. The latter option is to find trim states not aligned with the steady wind.	0. Moored heading aligned with ambient wind or due north (calm atmosphere)	ψ_o	$\lvert\psi_o\rvert < 6.28$
		Namelist NTSDEFL			
DELTAL	a) HLAMOR b) INMTRA	Aileron angle; positive aileron deflection will produce a negative tail rolling moment	0. No deflection for this tail control (mooring simulation)	δ_a	
DELTEL	a) HLAMOR b) INMTRA	Elevator angle; positive elevator deflection angle will produce a positive z-tail force	0. No deflection for this tail control (mooring simulation)	δ_e	
DELTRD	a) HLAMOR b) INMTRA	Rudder angle; positive rudder deflection angle will produce a positive y-tail force	0. No deflection for this tail control (mooring simulation)	δ_r	
		Namelist NINDMST			
DHLEUL	a) HLAMOR b) INMRST	Euler angle increments away from moored trim angles to excite the vehicle for time history simulation	0. No hull Euler angle disturbance for mooring time history	$\Delta\underline{\eta}_I^h$	

APPENDIX B

SAMPLE PROGRAM OUTPUT

This appendix contains the output listing from two program runs.

1) Program HLASIM

   This run models the vehicle only in flight. Flight control system commands are issued to create a climbing turn. The data files listed in Appendix C were used to make this run. This run with those data files can be used as a check solution by a user implementing the program on a different computer system.

   Data files PAYDTA, MORDTA, and RG1-RG6 (in Appendix C) are not used in this program run.

2) Program HLAPAY

   This run models the vehicle with a payload. This is to provide an example of the combined vehicle/payload so only the input data and trim solution is included here. The data file PAYDTA in Appendix C was used by this run, but the other data files are different. If the user wishes to match this run he must create the input files from the input variables listed in the run heading.

```
**********************************************************************

                HEAVY LIFT AIRSHIP FLIGHT SIMULATION

**********************************************************************

----------RUN DESCRIPTION----------

    PROGRAM HLASIM          DATE - 81/12/16.        TIME - 15.23.22.

TEST RUN15
FLIGHT CONTROL SYSTEM COMMANDS
CLIMBING TURN

----------

**********************************************************************
```

****INPUT DATA****

----------GEOMETRY INPUTS----------

```
------BASIC HULL MEASUREMENTS
HULARA =  .1942E+05 FT.**2                    SIDE PROJECTED AREA
HULDIA =  .1030E+03 FEET                      MAXIMUM DIAMETER
HULID  =          1                           CONFIGURATION ID #
HULTH  =  .2400E+03 FEET                      LENGTH OF HULL
HULVOL =  .1500E+07 FT.**3                    TOTAL DISPLACEMENT VOLUME

------BASIC TAIL MEASUREMENTS
NUMFIN =          2                           NUMBER OF FINS
RTALOC =  -87.50,    0.00,    0.00 FEET      TAIL VECTOR FROM HULL CV
TALARA =  .2520E+04              FT.**2       TAIL REFERENCE AREA
TSPAN  =  .1100E+03              FEET         TAIL SPAN
TALID  =          1                           TAIL CONFIGURATION ID #

------BASIC LPU VALUES
NUMLPU =          4                           NUMBER OF LPUS
LPUID  =          1                           CONFIGURATION ID #

------FOUR VECTORS FROM HULL CV REFERENCE AXES TO EACH LPU ATTACH POINT
RATCH1 =  .3800E+02 -.8150E+02  .5900E+02  FEET
RATCH2 =  .3800E+02  .8150E+02  .5900E+02  FEET
RATCH3 = -.3800E+02 -.8150E+02  .5900E+02  FEET
RATCH4 = -.3800E+02  .8150E+02  .5900E+02  FEET

------FOUR VECTORS FROM EACH LPU FUSELAGE REFERENCE AXES TO ITS HULL ATTACH POINT
RLTCH1 = 0.         0.          .3000E+01  FEET
RLTCH2 = 0.         0.          .3000E+01  FEET
RLTCH3 = 0.         0.          .3000E+01  FEET
RLTCH4 = 0.         0.          .3000E+01  FEET

------VECTORS TO THE POSITION OF EACH ROTOR HUB WITH RESPECT TO ITS LPU FUSELAGE REFERENCE AXES
RROTR1 = 0.         0.         -.7000E+01  FEET
RROTR2 = 0.         0.         -.7000E+01  FEET
RROTR3 = 0.         0.         -.7000E+01  FEET
RROTR4 = 0.         0.         -.7000E+01  FEET

------ROTOR CONFIGURATION
NRBLD1 =          4                                 NUMBER OF BLADES ROTOR 1
NRBLD2 =          4                                 NUMBER OF BLADES ROTOR 2
NRBLD3 =          4                                 NUMBER OF BLADES ROTOR 3
NRBLD4 =          4                                 NUMBER OF BLADES ROTOR 4

RADRT1 =    28.0000 FEET                            EFFECTIVE RADIUS ROTOR 1
RADRT2 =    28.0000 FEET                            EFFECTIVE RADIUS ROTOR 2
RADRT3 =    28.0000 FEET                            EFFECTIVE RADIUS ROTOR 3
RADRT4 =    28.0000 FEET                            EFFECTIVE RADIUS ROTOR 4

CORDR1 =     1.3700 FEET                            BLADE CHORD AT 3/4 RADIUS STATION ROTOR 1
CORDR2 =     1.3700 FEET                            BLADE CHORD AT 3/4 RADIUS STATION ROTOR 2
CORDR3 =     1.3700 FEET                            BLADE CHORD AT 3/4 RADIUS STATION ROTOR 3
CORDR4 =     1.3700 FEET                            BLADE CHORD AT 3/4 RADIUS STATION ROTOR 4
```

```
-----VECTORS TO THE POSITION OF EACH PROPELLER HUB WITH RESPECT TO ITS LPU FUSELAGE REFERENCE AXES
RPROP1 =  .1400E+02 0.          0.          FEET
RPROP2 =  .1400E+02 0.          0.          FEET
RPROP3 =  .1400E+02 0.          0.          FEET
RPROP4 =  .1400E+02 0.          0.          FEET

-----PROPELLER CONFIGURATION
NPBLD1 =          3                         NUMBER OF BLADES PROPELLER 1
NPBLD2 =          3                         NUMBER OF BLADES PROPELLER 2
NPBLD3 =          3                         NUMBER OF BLADES PROPELLER 3
NPBLD4 =          3                         NUMBER OF BLADES PROPELLER 4

RADP1  =     6.5500 FEET                    EFFECTIVE RADIUS PROPELLER 1
RADP2  =     6.5500 FEET                    EFFECTIVE RADIUS PROPELLER 2
RADP3  =     6.5500 FEET                    EFFECTIVE RADIUS PROPELLER 3
RADP4  =     6.5500 FEET                    EFFECTIVE RADIUS PROPELLER 4

CORDP1 =      .6550 FEET                    BLADE CHORD AT 3/4 RADIUS STATION PROPELLER 1
CORDP2 =      .6550 FEET                    BLADE CHORD AT 3/4 RADIUS STATION PROPELLER 2
CORDP3 =      .6550 FEET                    BLADE CHORD AT 3/4 RADIUS STATION PROPELLER 3
CORDP4 =      .6550 FEET                    BLADE CHORD AT 3/4 RADIUS STATION PROPELLER 4

-----LATERAL CONTROL AXIS DEFLECTION FOR:
A1SP1  =     0.0000 RADIANS                 PROPELLER-1
A1SP2  =     0.0000 RADIANS                 PROPELLER-2
A1SP3  =     0.0000 RADIANS                 PROPELLER-3
A1SP4  =     0.0000 RADIANS                 PROPELLER-4

-----LONGITUDNIAL CONTROL AXIS DEFLECTION FOR:
B1SP1  =     1.6060 RADIANS                 PROPELLER-1
B1SP2  =     1.5360 RADIANS                 PROPELLER-2
B1SP3  =     1.6060 RADIANS                 PROPELLER-3
B1SP4  =     1.5360 RADIANS                 PROPELLER-4

-----LPU EULER ANGLES WITH RESPECT TO THE HULL CENTER OF VOLUME REFERENCE AXES
GBANG1 = 0.          .3500E-01 0.          RADIANS
GBANG2 = 0.         -.3500E-01 0.          RADIANS
GBANG3 = 0.          .3500E-01 0.          RADIANS
GBANG4 = 0.         -.3500E-01 0.          RADIANS
```

```
----------------------------------------------------MOORING POINT GEOMETRY--------------------

-----MOORING POINT ON MAST IN INERTIAL COORDINATES
MASTLC = 0.          0.          -.650E+02  FEET

-----MOORING POINT ON HULL RELATIVE TO THE HULL CENTER OF VOLUME
RMORPT =  .120E+03 0.          0.          FEET


-----------------------------------------LANDING GEAR ATTACH POINTS AND SPRING CONSTANTS--------

-----LANDING GEAR ATTACH POINTS ON THE HULL
RATHG1 =  .360E+02 -.460E+02  .620E+02  FEET
RATHG2 =  .360E+02  .460E+02  .620E+02  FEET
RATHG3 = -.360E+02 -.460E+02  .620E+02  FEET
RATHG4 = -.360E+02  .460E+02  .620E+02  FEET

-----LANDING GEAR LENGTHS
LGRLN1 =  .332E+01 FEET                    LANDING GEAR 1
LGRLN2 =  .332E+01 FEET                    LANDING GEAR 2
LGRLN3 =  .332E+01 FEET                    LANDING GEAR 3
LGRLN4 =  .332E+01 FEET                    LANDING GEAR 4

-----LANDING GEAR SPRING CONSTANTS
GEARK1 =  .777E+04 LB / FT
GEARK2 =  .777E+04 LB / FT
GEARK3 =  .777E+04 LB / FT
GEARK4 =  .777E+04 LB / FT

-----LANDING GEAR FRAME STIFFNESS CONSTANTS
GFRMK1 =  .777E+05 LB / FT
GFRMK2 =  .777E+05 LB / FT
GFRMK3 =  .777E+05 LB / FT
GFRMK4 =  .777E+05 LB / FT

-----LANDING GEAR SPRING DAMPING CONSTANTS
GEARC1 =  .155E+04 (LB * SEC) / FT
GEARC2 =  .155E+04 (LB * SEC) / FT
GEARC3 =  .155E+04 (LB * SEC) / FT
GEARC4 =  .155E+04 (LB * SEC) / FT

-----LANDING GEAR FRICTION CONSTANTS
MUKG1  =  .800E-01
MUKG2  =  .800E-01
MUKG3  =  .800E-01
MUKG4  =  .800E-01
```

```
----------------------------------------------MASS AND MOMENT OF INERTIA INPUTS-------------

-----HULL CENTER OF GRAVITY VECTOR WITH RESPECT TO HULL CENTER OF VOLUME REFERENCE AXES
RHULCG = 0.          0.          .1663E+02  FEET

-----MASS AND MOMENT OF INERTIA OF HULL
MASHUL =  .2762E+04 SLUGS                        COMPLETE MASS OF HULL STRUCTURE
IHULXX =  .6350E+07 SLUG*(FT.**2)                MOMENT OF INERTIA ABOUT CG X AXES
IHULYY =  .1348E+08 SLUG*(FT.**2)                MOMENT OF INERTIA ABOUT CG Y AXES
IHULZZ =  .1329E+08 SLUG*(FT.**2)                MOMENT OF INERTIA ABOUT CG Z AXES
IHULXZ = 0.         SLUG*(FT.**2)                PRODUCT OF INERTIA WRT THE CG XZ AXES

-----FOUR VECTORS LOCATING EACH LPU'S CG WITH RESPECT TO ITS FUSELAGE REFERENCE AXES
RCGLP1 = 0.          0.          0.          FEET
RCGLP2 = 0.          0.          0.          FEET
RCGLP3 = 0.          0.          0.          FEET
RCGLP4 = 0.          0.          0.          FEET

-----MASS AND MOMENT OF INERTIA OF LPU-1
MASLP1 =  .2795E+03 SLUGS                        MASS OF LPU-1
ILP1XX =  .8570E+04 SLUG*(FT.**2)                MOMENT OF INERTIA ABOUT CG X AXES
ILP1YY =  .4006E+05 SLUG*(FT.**2)                MOMENT OF INERTIA ABOUT CG Y AXES
ILP1ZZ =  .3940E+05 SLUG*(FT.**2)                MOMENT OF INERTIA ABOUT CG Z AXES
ILP1XZ = 0.         SLUG*(FT.**2)                PRODUCT OF INERTIA WRT THE CG XZ AXES

-----MASS AND MOMENT OF INERTIA OF LPU-2
MASLP2 =  .2795E+03 SLUGS                        MASS OF LPU-2
ILP2XX =  .8570E+04 SLUG*(FT.**2)                MOMENT OF INERTIA ABOUT CG X AXES
ILP2YY =  .4006E+05 SLUG*(FT.**2)                MOMENT OF INERTIA ABOUT CG Y AXES
ILP2ZZ =  .3940E+05 SLUG*(FT.**2)                MOMENT OF INERTIA ABOUT CG Z AXES
ILP2XZ = 0.         SLUG*(FT.**2)                PRODUCT OF INERTIA WRT THE CG XZ AXES

-----MASS AND MOMENT OF INERTIA OF LPU-3
MASLP3 =  .2795E+03 SLUGS                        MASS OF LPU-3
ILP3XX =  .8570E+04 SLUG*(FT.**2)                MOMENT OF INERTIA ABOUT CG X AXES
ILP3YY =  .4006E+05 SLUG*(FT.**2)                MOMENT OF INERTIA ABOUT CG Y AXES
ILP3ZZ    .3940E+05 SLUG*(FT.**2)                MOMENT OF INERTIA ABOUT CG Z AXES
ILP3XZ              SLUG*(FT.**2)                PRODUCT OF INERTIA WRT THE CG XZ AXES

-----MASS AND MOMENT OF INERTIA OF LPU-4
MASLP4 =  .2795E+03 SLUGS                        MASS OF LPU-4
ILP4XX =  .8570E+04 SLUG*(FT.**2)                MOMENT OF INERTIA ABOUT CG X AXES
ILP4YY =  .4006E+05 SLUG*(FT.**2)                MOMENT OF INERTIA ABOUT CG Y AXES
ILP4ZZ =  .3940E+05 SLUG*(FT.**2)                MOMENT OF INERTIA ABOUT CG Z AXES
ILP4XZ = 0.         SLUG*(FT.**2)                PRODUCT OF INERTIA WRT THE CG XZ AXES

-----ROTOR LOCK NUMBER
LOCNR1 =    15.0000                              ROTOR 1
LOCNR2 =    15.0000                              ROTOR 2
LOCNR3 =    15.0000                              ROTOR 3
LOCNR4 =    15.0000                              ROTOR 4
```

----------EXHAUST THRUST INPUTS----------

-----EXHAUST JET FORCES

JETHS1 =	.1000E+03 LBS.		LPU 1
JETHS2 =	.1000E+03 LBS.		LPU 2
JETHS3 =	.1000E+03 LBS.		LPU 3
JETHS4 =	.1000E+03 LBS.		LPU 4

-----LOCATION OF THE EXHAUST NOZZLES WITH RESPECT TO THE FUSELAGE REFERENCE CENTERS

REXLC1 =	-.1000E+02	0.	-.3000E+01	FEET	LPU 1
REXLC2 =	-.1000E+02	0.	-.3000E+01	FEET	LPU 2
REXLC3 =	-.1000E+02	0.	-.3000E+01	FEET	LPU 3
REXLC4 =	-.1000E+02	0.	-.3000E+01	FEET	LPU 4

-----ANGULAR ORIENTATIONS OF THE EXHAUST NOZZLES WITH RESPECT TO THE FUSELAGE REFERENCE CENTERS

A1SE1 =	0.	RADIANS	LPU 1
B1SE1 =	.1400E+01	RADIANS	LPU 1
A1SE2 =	0.	RADIANS	LPU 2
B1SE2 =	.1400E+01	RADIANS	LPU 2
A1SE3 =	0.	RADIANS	LPU 3
B1SE3 =	.1400E+01	RADIANS	LPU 3
A1SE4 =	0.	RADIANS	LPU 4
B1SE4 =	.1400E+01	RADIANS	LPU 4

```
----------------------------------------LPU AERODYNAMIC PARAMETERS INPUT--------------------

-----FOUR VECTORS LOCATING FUSELAGE AERODYNAMIC CENTER WITH RESPECT TO LPU FUSELAGE REFERENCE AXES
RACLP1 = 0.          0.          0.          FEET
RACLP2 = 0.          0.          0.          FEET
RACLP3 = 0.          0.          0.          FEET
RACLP4 = 0.          0.          0.          FEET

-----ROTOR BLADE LIFT CURVE SLOPE AND DRAG COEFFICIENTS

LCSR1  =     5.7300 1/RAD.                    ROTOR 1
DLTR1A =      .0087 1/RAD.
DLTR1B =     -.0216 1/RAD.
DLTR1C =      .4000 1/RAD.

LCSR2  =     5.7300 1/RAD.                    ROTOR 2
DLTR2A =      .0087 1/RAD.
DLTR2B =     -.0216 1/RAD.
DLTR2C =      .4000 1/RAD.

LCSR3  =     5.7300 1/RAD.                    ROTOR 3
DLTR3A =      .0087 1/RAD.
DLTR3B =     -.0216 1/RAD.
DLTR3C =      .4000 1/RAD.

LCSR4  =     5.7300 1/RAD.                    ROTOR 4
DLTR4A =      .0087 1/RAD.
DLTR4B =     -.0216 1/RAD.
DLTR4C =      .4000 1/RAD.

-----PROPELLER BLADE LIFT CURVE SLOPE AND DRAG COEFFICIENTS

LCSP1  =     5.7300 1/RAD.                    PROPELLER 1
DLTP1A =      .0087 1/RAD.
DLTP1B =     -.0216 1/RAD.
DLTP1C =      .4000 1/RAD.

LCSP2  =     5.7300 1/RAD.                    PROPELLER 2
DLTP2A =      .0087 1/RAD.
DLTP2B =     -.0216 1/RAD.
DLTP2C =      .4000 1/RAD.

LCSP3  =     5.7300 1/RAD.                    PROPELLER 3
DLTP3A =      .0087 1/RAD.
DLTP3B =     -.0216 1/RAD.
DLTP3C =      .4000 1/RAD.

LCSP4  =     5.7300 1/RAD.                    PROPELLER 4
DLTP4A =      .0087 1/RAD.
DLTP4B =     -.0216 1/RAD.
DLTP4C =      .4000 1/RAD.
```

```
----LPU FUSELAGE AERODYNAMIC X-FORCE DERIVATIVES WITH RESPECT TO U * ABS(U)
XUUAF1 =    -.0220 LB*(S**2)/(FT**2)          FUSELAGE 1
XUUAF2 =    -.0220 LB*(S**2)/(FT**2)          FUSELAGE 2
XUUAF3 =    -.0220 LB*(S**2)/(FT**2)          FUSELAGE 3
XUUAF4 =    -.0220 LB*(S**2)/(FT**2)          FUSELAGE 4

-----LPU FUSELAGE AERODYNAMIC Y-FORCE DERIVATIVES WITH RESPECT TO V * ABS(V)
YVVAF1 =    -.2010 LB*(S**2)/(FT**2)          FUSELAGE 1
YVVAF2 =    -.2010 LB*(S**2)/(FT**2)          FUSELAGE 2
YVVAF3 =    -.2010 LB*(S**2)/(FT**2)          FUSELAGE 3
YVVAF4 =    -.2010 LB*(S**2)/(FT**2)          FUSELAGE 4

-----LPU FUSELAGE AERODYNAMIC Z-FORCE DERIVATIVES WITH RESPECT TO W * ABS(W)
ZWWAF1 =    -.6460 LB*(S**2)/(FT**2)          FUSELAGE 1
ZWWAF2 =    -.6460 LB*(S**2)/(FT**2)          FUSELAGE 2
ZWWAF3 =    -.6460 LB*(S**2)/(FT**2)          FUSELAGE 3
ZWWAF4 =    -.6460 LB*(S**2)/(FT**2)          FUSELAGE 4
```

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----------------------------------------------HULL AERODYNAMIC PARAMETERS INPUT----------------------------------

-----HULL ACCELERATION DERIVATIVES
XUDOTH = -.6634E+03 LB*(S**2)/FT                X FORCE DERIVATIVE WITH RESPECT TO LONGITUDINAL ACCELERATION
YVDOTH = -.2600E+04 LB*(S**2)/FT                Y FORCE DERIVATIVE WITH RESPECT TO LATERAL ACCELERATION
ZWDOTH = -.2600E+04 LB*(S**2)/FT                Z FORCE DERIVATIVE WITH RESPECT TO DOWNWARD ACCELERATION
LPDOTH = 0.         FT*LB*(S**2)/RAD            ROLLING MOMENT DERIVATIVE WITH RESPECT TO ROLLING ACCELERATION
MQDOTH = -.3610E+07 FT*LB*(S**2)/RAD            PITCHING MOMENT DERIVATIVE WITH RESPECT TO PITCHING ACCELERATION
NRDOTH = -.3610E+07 FT*LB*(S**2)/RAD            YAWING MOMENT DERIVATIVE WITH RESPECT TO YAW ACCELERATION

-----TAIL ACCELERATION DERIVATIVES
YVDOTT = -.4894E+03 LB*(S**2)/FT                Y FORCE DERIVATIVE WITH RESPECT TO LATERAL ACCELERATION
ZWDOTT = -.6050E+03 LB*(S**2)/FT                Z FORCE DERIVATIVE WITH RESPECT TO DOWNWARD ACCELERATION
LVDOTT = -.9787E+04 LB*(S**2)                   ROLLING MOMENT DERIVATIVE WITH RESPECT TO LATERAL ACCELERATION
LPDOTT = -.3866E+06 FT*LB*(S**2)/RAD            ROLLING MOMENT DERIVATIVE WITH RESPECT TO ROLLING ACCELERATION
MQDOTT = -.3891E+04 FT*LB*(S**2)/RAD            PITCHING MOMENT DERIVATIVE WITH RESPECT TO PITCHING ACCELERATION
NRDOTT = -.3891E+04 FT*LB*(S**2)/RAD            YAWING MOMENT DERIVATIVE WITH RESPECT TO YAW ACCELERATION

-----HULL X FORCE DERIVATIVES WITH RESPECT TO:
XUUABH = -.4136E+00 LB*(S**2)/(FT**2)           U * ABS(U)
XQWH   = -.2600E+04 LB*(S**2)/(RAD*FT)          Q * W
XRVH   =  .2600E+04 LB*(S**2)/(FT**2)           R * V

-----HULL Y FORCE DERIVATIVES WITH RESPECT TO:
YVVABH = -.2804E+02 LB*(S**2)/(FT**2)           V * ABS(V)
YRRABH = 0.         LB*(S**2)/(RAD*FT)          R * ABS(R)
YPWH   =  .2600E+04 LB*(S**2)/(RAD*FT)          P * W
YRUH   = -.6634E+03 LB*(S**2)/(RAD*FT)          R * U
YRVABH = 0.         LB*(S**2)/(RAD*FT)          R * ABS(V)

-----HULL Z FORCE DERIVATIVES WITH RESPECT TO:
ZWWABH = -.2804E+02 LB*(S**2)/(FT**2)           W * ABS(W)
ZQQABH = 0.         LB*(S**2)/(RAD**2)          Q * ABS(Q)
ZPVH   = -.2600E+04 LB*(S**2)/(RAD*FT)          P * V
ZQUH   =  .6634E+03 LB*(S**2)/(RAD*FT)          Q * U
ZQWABH = 0.         LB*(S**2)/(RAD*FT)          Q * ABS(W)

-----HULL ROLLING MOMENT DERIVATIVES WITH RESPECT TO:
LPPABH = -.1314E+05 FT*LB*(S**2)/(RAD**2)       P * ABS(P)
LPUABH = 0.         FT*LB*(S**2)/(RAD**2)       P * ABS(U)
LVWH   = 0.         LB*(S**2)/FT                V * W
LQBRH  = -.3610E+07 FT*LB*(S**2)/(RAD**2)       QB * R
LRBQH  =  .3610E+07 FT*LB*(S**2)/(RAD**2)       RB * Q

-----HULL PITCHING MOMENT DERIVATIVES WITH RESPECT TO:
MQQABH = -.8220E+07 FT*LB*(S**2)/(RAD**2)       Q * ABS(Q)
MUWH   =  .1452E+04 LB*(S**2)/FT                U * W
MRBPH  = 0.         FT*LB*(S**2)/(RAD**2)       RB * P
MPBRH  =  .3610E+07 FT*LB*(S**2)/(RAD**2)       PB * R
MUWABH = -.2017E+06 LB*(S**2)/RAD               Q * ABS(W)

-----HULL YAWING MOMENT DERIVATIVE WITH RESPECT TO:
NRRABH = -.8220E+07 FT*LB*(S**2)/(RAD**2)       R * ABS(R)
NUVH   = -.1452E+04 LB*(S**2)/FT                U * V
NPBQH  = -.3610E+07 FT*LB*(S**2)/(RAD**2)       PB * Q
NQBPH  = 0.         FT*LB*(S**2)/(RAD**2)       QB * P
NRVABH = -.2017E+06 LB*(S**2)/RAD               R * ABS(V)
```

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-----TAIL X FORCE DERIVATIVES WITH RESPECT TO:
XUUABT = -.1379E+00 LB*(S**2)/(FT**2)              U * ABS(U)

-----TAIL Y FORCE DERIVATIVES WITH RESPECT TO:
YVVABT = -.2446E+01 LB*(S**2)/(FT**2)              V * ABS(V)
YPPABT = -.3233E+04 LB*(S**2)/(RAD  )              P * ABS(P)
YAPVST = -.1467E+01 LB*(S**2)/(RAD (FT**2))        ALPHA-P * (VPT**2)
YBVSQT = -.2670E+01 LB*(S**2)/(RAD*(FT**2))        BETA * (VXY**2)
YBSVST = -.1734E+01 LB*(S**2)/((RAD**2)*(FT**2)) BETA*ABS(BETA)*(VXYT**2)
YAPSVS = -.2939E+01 LB*(S**2)/((RAD**2)*(FT**2)) ALPHA:P*ABS(ALPHA:P)*(VPT**2)

-----TAIL Z FORCE DERIVATIVES WITH RESPECT TO:
ZWWABT = -.2446E+01 LB*(S**2)/(FT**2)              W * ABS(W)
ZAVSQT = -.4141E+01 LB*(S**2)/(RAD*(FT**2))        ALPHA * VXZ**2
ZASVST = -.4000E+00 LB*(S**2)/((RAD**2)*(FT**2)) ALPHA*ABS(ALPHA)*(VXZ**2)

-----TAIL ROLL MOMENT DERIVATIVES WITH RESPECT TO:
LVVABT = -.4890E+01 LB*(S**2)/FT                   V * ABS(V)
LPPABT = -.1707E+06 LB*(S**2)/(RAD*FT)             P * ABS(P)
LAPVST = -.7740E+02 LB*(S**2)/(RAD*FT)             ALPHA-P * VPT**2
LBVSQT = -.3030E+01 LB*(S**2)/(RAD*FT)             BETA * VXY**2
LBAVST = -.1520E+01 LB*(S**2)/((RAD**2)*FT)        BETA*ALPHA*(VXY**2)
LAPSVS = -.1551E+03 LB*(S**2)/((RAD**2)*FT)        ALPHA:P*ABS(ALPHA:P)*(VPT**2)

-----TAIL LOCATION SCALE FACTORS
LAMTXQ =      .7000                                X-AXIS CORRECTION FOR PITCHING MOMENTS
LAMTXR =      .7000                                X-AXIS CORRECTION FOR YAWING MOMENTS
LAMTZQ =     1.0000                                Z-AXIS CORRECTION FOR PITCHING MOMENTS

-----STALL PARAMETERS
AL1T   =  .5236E+00 RADIANS                        LONGITUDINAL TAIL STALLING PARAMETERS
AL2T   =  .6981E+00 RADIANS
BETA1T =  .5236E+00 RADIANS                        LATERAL TAIL STALL PARAMETERS
BETA2T =  .6981E+00 RADIANS
ALP1T  =  .5236E+00 RADIANS                        TAIL ROLLING STALL PARAMETERS
ALP2T  =  .6981E+00 RADIANS

-----TAIL SURFACE EFFECTIVENESS PARAMETERS
TAUA   =  .5000E+00 (SEC**2) / (FT**2)             AILERON
TAUE   =  .5000E+00 (SEC**2) / (FT**2)             ELEVATOR
TAUR   =  .5000E+00 (SEC**2) / (FT**2)             RUDDER
```

```
-----------------------------------------------INTERFERENCE CONSTANTS ON ROTOR--------

-----SHADOW CONSTANTS ROTOR 1
BWK1R1 =   .1745E+01 RADIANS          BETA WAKE ANGLE 1
BWK2R1 =   .2967E+01 RADIANS          BETA WAKE ANGLE 2
MXBDR1 =   .8500E+00                  BETA WAKE MAXIMUM DEFECT
LWK1R1 =   .1310E+01 RADIANS          LAMBDA WAKE ANGLE 1
LWK2R1 =   .2880E+01 RADIANS          LAMBDA WAKE ANGLE 2
MXLDR1 =   .8500E+00                  LAMBDA WAKE MAXIMUM DEFECT

-----SHADOW CONSTANTS ROTOR 2
BWK1R2 =   .3116E+01 RADIANS          BETA WAKE ANGLE 1
BWK2R2 =   .4538E+01 RADIANS          BETA WAKE ANGLE 2
MXBDR2 =   .8500E+00                  BETA WAKE MAXIMUM DEFECT
LWK1R2 =   .3403E+01 RADIANS          LAMBDA WAKE ANGLE 1
LWK2R2 =   .4974E+01 RADIANS          LAMBDA WAKE ANGLE 2
MXLDR2 =   .8500E+00                  LAMBDA WAKE MAXIMUM DEFECT

-----SHADOW CONSTANTS ROTOR 3
BWK1R3 =   .1745E+00 RADIANS          BETA WAKE ANGLE 1
BWK2R3 =   .1396E+01 RADIANS          BETA WAKE ANGLE 2
MXBDR3 =   .8500E+00                  BETA WAKE MAXIMUM DEFECT
LWK1R3 =   .1310E+01 RADIANS          LAMBDA WAKE ANGLE 1
LWK2R3 =   .2880E+01 RADIANS          LAMBDA WAKE ANGLE 2
MXLDR3 =   .8500E+00                  LAMBDA WAKE MAXIMUM DEFECT

-----SHADOW CONSTANTS ROTOR 4
BWK1R4 =   .4587E+01 RADIANS          BETA WAKE ANGLE 1
BWK2R4 =   .6109E+01 RADIANS          BETA WAKE ANGLE 2
MXBDR4 =   .8500E+00                  BETA WAKE MAXIMUM DEFECT
LWK1R4 =   .3403E+01 RADIANS          LAMBDA WAKE ANGLE 1
LWK2R4 =   .4974E+01 RADIANS          LAMBDA WAKE ANGLE 2
MXLDR4 =   .8500E+00                  LAMBDA WAKE MAXIMUM DEFECT

-----HULL ON ROTOR CONSTANTS
KHRA1  =   .1200E+02 LB / (FT**2)     ROTOR 1  A
KHRB1  =   .3330E-01                  ROTOR 1  B
KHRA2  =   .1200E+02 LB / (FT**2)     ROTOR 2  A
KHRB2  =   .3330E-01                  ROTOR 2  B
KHRA3  =   .1200E+02 LB / (FT**2)     ROTOR 3  A
KHRB3  =   .3330E-01                  ROTOR 3  B
KHRA4  =   .1200E+02 LB / (FT**2)     ROTOR 4  A
KHRB4  =   .3330E-01                  ROTOR 4  B

-----GROUND ON ROTOR CONSTANTS
KGR1   = -.2000E+01
KGR2   = -.2000E+01
KGR3   = -.2000E+01
KGR4   = -.2000E+01
```

----------INTERFERENCE CONSTANTS ON PROPELLER--------

-----SHADOW CONSTANTS PROPELLER 1

BWK1P1 =	.1745E+01 RADIANS	BETA WAKE ANGLE 1
BWK2P1 =	.2967E+01 RADIANS	BETA WAKE ANGLE 2
MXBDP1 =	.8500E+00	BETA WAKE MAXIMUM DEFECT
LWK1P1 =	.1310E+01 RADIANS	LAMBDA WAKE ANGLE 1
LWK2P1 =	.2880E+01 RADIANS	LAMBDA WAKE ANGLE 2
MXLDP1 =	.8500E+00	LAMBDA WAKE MAXIMUM DEFECT

-----SHADOW CONSTANTS PROPELLER 2

BWK1P2 =	.3316E+01 RADIANS	BETA WAKE ANGLE 1
BWK2P2 =	.4538E+01 RADIANS	BETA WAKE ANGLE 2
MXBDP2 =	.8500E+00	BETA WAKE MAXIMUM DEFECT
LWK1P2 =	.3403E+01 RADIANS	LAMBDA WAKE ANGLE 1
LWK2P2 =	.4974E+01 RADIANS	LAMBDA WAKE ANGLE 2
MXLDP2 =	.8500E+00	LAMBDA WAKE MAXIMUM DEFECT

-----SHADOW CONSTANTS PROPELLER 3

BWK1P3 =	.1745E+00 RADIANS	BETA WAKE ANGLE 1
BWK2P3 =	.1396E+01 RADIANS	BETA WAKE ANGLE 2
MXBDP3 =	.8500E+00	BETA WAKE MAXIMUM DEFECT
LWK1P3 =	.1310E+01 RADIANS	LAMBDA WAKE ANGLE 1
LWK2P3 =	.2880E+01 RADIANS	LAMBDA WAKE ANGLE 2
MXLDP3 =	.8500E+00	LAMBDA WAKE MAXIMUM DEFECT

-----SHADOW CONSTANTS PROPELLER 4

BWK1P4 =	.4887E+01 RADIANS	BETA WAKE ANGLE 1
BWK2P4 =	.6109E+01 RADIANS	BETA WAKE ANGLE 2
MXBDP4 =	.8500E+00	BETA WAKE MAXIMUM DEFECT
LWK1P4 =	.3403E+01 RADIANS	LAMBDA WAKE ANGLE 1
LWK2P4 =	.4974E+01 RADIANS	LAMBDA WAKE ANGLE 2
MXLDP4 =	.8500E+00	LAMBDA WAKE MAXIMUM DEFECT

-----HULL ON PROPELLER CONSTANTS

KHPA1 =	.1200E+02 LB / (FT**2)	PROPELLER 1 A
KHPB1 =	.3330E-01	PROPELLER 1 B
KHPA2 =	.1200E+02 LB / (FT**2)	PROPELLER 2 A
KHPB2 =	.3330E-01	PROPELLER 2 B
KHPA3 =	.1200E+02 LB / (FT**2)	PROPELLER 3 A
KHPB3 =	.3330E-01	PROPELLER 3 B
KHPA4 =	.1200E+02 LB / (FT**2)	PROPELLER 4 A
KHPB4 =	.3330E-01	PROPELLER 4 B

-----ROTOR ON PROPELLER CONSTANTS

KRP1 =	.1600E+01	LPU 1
KRP2 =	.1600E+01	LPU 2
KRP3 =	.1600E+01	LPU 3
KRP4 =	.1600E+01	LPU 4

-----GROUND ON PROPELLER CONSTANTS

KGP1 =	-.2000E+01	LPU 1
KGP2 =	-.2000E+01	LPU 2
KGP3 =	-.2000E+01	LPU 3
KGP4 =	-.2000E+01	LPU 4

```
----------INTERFERENCE CONSTANTS ON FUSELAGE----------

-----SHADOW CONSTANTS FUSELAGE 1
BWK1F1 =  .1745E+01 RADIANS     BETA WAKE ANGLE 1
BWK2F1 =  .2967E+01 RADIANS     BETA WAKE ANGLE 2
MXBDF1 =  .8500E+00             BETA WAKE MAXIMUM DEFECT
LWK1F1 =  .1310E+01 RADIANS     LAMBDA WAKE ANGLE 1
LWK2F1 =  .2880E+01 RADIANS     LAMBDA WAKE ANGLE 2
MXLDF1 =  .8500E+00             LAMBDA WAKE MAXIMUM DEFECT

-----SHADOW CONSTANTS FUSELAGE 2
BWK1F2 =  .3316E+01 RADIANS     BETA WAKE ANGLE 1
BWK2F2 =  .4538E+01 RADIANS     BETA WAKE ANGLE 2
MXBDF2 =  .8500E+00             BETA WAKE MAXIMUM DEFECT
LWK1F2 =  .3403E+01 RADIANS     LAMBDA WAKE ANGLE 1
LWK2F2 =  .4974E+01 RADIANS     LAMBDA WAKE ANGLE 2
MXLDF2 =  .8500E+00             LAMBDA WAKE MAXIMUM DEFECT

-----SHADOW CONSTANTS FUSELAGE 3
BWK1F3 =  .1745E+00 RADIANS     BETA WAKE ANGLE 1
BWK2F  =  .1396E+01 RADIANS     BETA WAKE ANGLE 2
MXBDF3 =  .8500E+00             BETA WAKE MAXIMUM DEFECT
LWK1F3 =  .1310E+01 RADIANS     LAMBDA WAKE ANGLE 1
LWK2F3 =  .2890E+01 RADIANS     LAMBDA WAKE ANGLE 2
MXLDF3 =  .8500E+00             LAMBDA WAKE MAXIMUM DEFECT

-----SHADOW CONSTANTS FUSELAGE 4
BWK1F4 =  .4897E+01 RADIANS     BETA WAKE ANGLE 1
BWK2F4 =  .6109E+01 RADIANS     BETA WAKE ANGLE 2
MXBDF4 =  .8500E+00             BETA WAKE MAXIMUM DEFECT
LWK1F4 =  .3403E+01 RADIANS     LAMBDA WAKE ANGLE 1
LWK2F4 =  .4974E+01 RADIANS     LAMBDA WAKE ANGLE 2
MXLDF4 =  .8500E+00             LAMBDA WAKE MAXIMUM DEFECT

-----ROTOR ON FUSELAGE CONSTANTS
KRF1   =  .1600E+01             FUSELAGE 1
KRF2   =  .1600E+01             FUSELAGE 2
KRF3   =  .1600E+01             FUSELAGE 3
KRF4   =  .1600E+01             FUSELAGE 4

-----PROPELLER ON FUSELAGE CONSTANTS
KPF1   =  .1600E+01
KPF2   =  .1600E+01
KPF3   =  .1600E+01
KPF4   =  .1600E+01
```

----------INTERFERENCE CONSTANTS ON HULL---------

-----GROUND ON HULL CONSTANTS
AGMA = -.4160E+01 A CONSTANT
AGMB = -.4160E+01 B CONSTANT

-----ROTOR 1 ON HULL
ARMA1 = 0. SEC / FT
ARMB1 = .1000E-03 (SEC**2) / (FT**2)
ARML1 = .2600E+00
ARMD1 = -.4300E-01
ARME1 = .3330E-01

-----ROTOR 2 ON HULL
ARMA2 = 0. SEC / FT
ARMB2 = .1000E-03 (SEC**2) / (FT**2)
ARML2 = .2600E+00
ARMD2 = .4300E-01
ARME2 = .3330E-01

-----ROTOR 3 ON HULL
ARMA3 = 0. SEC / FT
ARMB3 = .1000E-03 (SEC**2) / (FT**2)
ARML3 = -.2600E+00
ARMD3 = -.4300E-01
ARME3 = .3330E-01

-----ROTOR 4 ON HULL
ARMA4 = 0. SEC / FT
ARMB4 = .1000E-03 (SEC**2) / (FT**2)
ARML4 = -.2600E+00
ARMD4 = .4300E-01
ARME4 = .3330E-01

-----PROPELLER 1 ON HULL
APMA1 = 0. SEC / FT
APMB1 = .3390E-05 (SEC**2) / (FT**2)
APML1 = .1090E-01
APMD1 = -.2360E-02
APME1 = .1630E-02

-----PROPELLER 2 ON HULL
APMA2 = 0. SEC / FT
APMB2 = .3390E-05 (SEC**2) / (FT**2)
APML2 = .1090E-01
APMD2 = -.2360E-02
APME2 = .1630E-02

-----PROPELLER 3 ON HULL
APMA3 = 0. SEC / FT
APMB3 = .3390E-05 (SEC**2) / (FT**2)
APML3 = -.1090E-01
APMD3 = -.2360E-02
APME3 = .1630E-02

-----PROPELLER 4 ON HULL
APMA4 = 0. SEC / FT
APMB4 = .3390E-05 (SEC**2) / (FT**2)
APML4 = -.1090E-01
APMD4 = -.2360E-02
APME4 = .1630E-02

```
----------------------------------------------------INTERFERENCE CONSTANTS ON TAIL----

-----ROTOR 1 ON TAIL CONSTANTS
AATA1  =  .1400E-01
AAT01  = -.5700E-02
AAT02  =  .5200E-02

-----ROTOR 2 ON TAIL CONSTANTS
AATA2  =  .1400E-01
AAT02  =  .5700E-02
AAT02  =  .5200E-02

-----ROTOR 3 ON TAIL CONSTANTS
AATA3  =  .3690E-01
AAT03  = -.1240E-01
AAT03  =  .1100E-01

-----ROTOR 4 ON TAIL CONSTANTS
AATA4  =  .3690E-01
AAT04  =  .1240E-01
AAT04  =  .1100E-01

-----PROPELLER 1 ON TAIL CONSTANTS
APTA1  =  .7000E-03
APT01  = -.3670E-03
APT02  =  .2700E-03

-----PROPELLER 2 ON TAIL CONSTANTS
APTA2  =  .7000E-03
APT02  =  .3070E-03
APT02  =  .2700E-03

-----PROPELLER 3 ON TAIL CONSTANTS
APTA3  =  .1090E-01
APT03  = -.5000E-03
APT03  =  .4900E-03

-----PROPELLER 4 ON TAIL CONSTANTS
APTA4  =  .1090E-02
APT04  =  .5000E-03
APT04  =  .4900E-03

-----GROUND ON TAIL CONSTANTS
AGTA   = -.2277E-02 (SEC**2) / (FT**2)
AGT0   =  .1000E+02 (SEC**2) / (FT**2)
```

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------------------------------------------------------------------------------
                                                  ---ROTOR AND PROPELLER SPIN RATES ----------

OMEGA1 =   4.566200 RAD./SEC.          ROTOR 1 SPIN RATE
OMEGA2 =   4.566200 RAD./SEC.          ROTOR 2 SPIN RATE
OMEGA3 =   4.566200 RAD./SEC.          ROTOR 3 SPIN RATE
OMEGA4 =   4.566200 RAD./SEC.          ROTOR 4 SPIN RATE

OMEGP1 =  14.066000 RAD./SEC.          PROPELLER 1 SPIN RATE
OMEGP2 =  14.066000 RAD./SEC.          PROPELLER 2 SPIN RATE
OMEGP3 =  14.066000 RAD./SEC.          PROPELLER 3 SPIN RATE
OMEGP4 =  14.066000 RAD./SEC.          PROPELLER 4 SPIN RATE

------------------------------------------------------------------------------
                                                  ---MECHANICAL FLIGHT CONTROL SYSTEM CONSTANTS----------

THEMAX =    .65000 RADIANS             MAXIMUM ROTOR COLLECTIVE PITCH ANGLE
ASMAX =     .65000 RADIANS             MAXIMUM ROTOR LATERAL CYCLIC PITCH ANGLE
BSMAX =     .65000 RADIANS             MAXIMUM ROTOR LONGITUDINAL CYCLIC PITCH ANGLE
THEPMX =    .65000 RADIANS             MAXIMUM PROPELLER COLLECTIVE PITCH ANGLE
ELAMAX =  .261800 RADIANS              MAXIMUM TAIL AILERON DEFLECTION
ELLMAX =  .261800 RADIANS              MAXIMUM TAIL ELEVATOR DEFLECTION
ELRMAX =  .436000 RADIANS              MAXIMUM TAIL RUDDER DEFLECTION
```

----------INERTIAL VEHICLE STATE INPUTS----------

-----HULL CG REFERENCE AXES VELOCITY VECTOR WITH RESPECT TO INERTIAL SPACE
VHOL = 14.000, 0.00, 0.00 FT./SEC.

-----HULL CG REFERENCE AXES INERTIAL POSITION IN INERTIAL COORDINATES
HCGPOS = 0.000, 0.00, -1000.00 FEET

-----EULER ANGLE RATES OF HULL CG REFERENCE AXES WITH RESPECT TO AN INERTIAL FRAME: PHIDOT, THEDOT PSIDOT
HOEULR = 0.000, 0.00, 0.00 RAD./SEC.

-----EULER ANGLES OF THE HULL CG REFERENCE AXES WITH RESPECT TO AN INERTIAL FRAME: PHI, THETA, PSI
HCEULR = 0.000, 0.00, 0.00 RADIANS

----------ATMOSPHERIC PARAMETER INPUTS----------

RHOREN = .002378E-02 SLUG / (FT**3) REFERENCE ATMOSPHERIC DENSITY
DENRAT = 1.00000 DENSITY RATIO
GRAV = .322174E+02 FT./(SEC.**2) EARTHS GRAVITATIONAL ACCELERATION
VWIND = -30.000, 0.00, 0.00, FT./SEC. STEADY WIND VECTOR IN INERTIAL FRAME (XYZ IN FT'S

----------STABILITY DERIVATIVE FLAGS----------

DERIVFL = T STABILITY DERIVATIVES TO BE CALCULATED
AMATFL = T A MATRIX
BMATFL = T B MATRIX
BPRIMFL = T B PRIME MATRIX
CMATFL = T C MATRIX
CFMATFL = T ALL CONSTRAINT FORCE (AUXILIARY) MATRICES

TRIM CASE NUMBER 1

THIS TRIM CONVERGED SATISFACTORILY

TRIM ALGORITHM CONTROL
ITERATIONS = 20 RESTARTS = 0 CONV. CRIT. = .890E-11
UCONTL = .09948 VCONTL = -.00533 WDCONTL = -.04279 PCONTL = -.00325 QCONTL = -.00124 RCONTL = .00241
CONTROL LIMITS FLAGGED DURING TRIM

TTHEX				TTHEP				TAILR				TAILP				SAOPTX	AILERON	ELEVATOR	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

SIMULATION TIME -- -.000

	U	V	W	P	Q	R	X	Y		Z
HULL	14.000	0.	0.	0.	0.	0.	0.	0.	-10700.	0.
	THETA	PSI	AXCGG	AYCGG	AZCGG	NORMT	NDTHT	VHGUST:X	VHGUST:Y	VHGUST:Z
HULL	0.	0.	-.278000E-11	-.5C973E 13	-.178326-13	9.8702	9.2421	0.	0.	0.
	UHGUST:X	UHGUST:Y	UHGUST:Z	DUGDXH	DUGDYH	DVGDYI	VDRHGT:X	VDRHGT:Y	VDRHGT:Z	DTHGST:X
HULL	0.	0.	0.	0.	0.	C.	0.	0.	0.	0.
	UDHGST:Y	UDHGST:Z	VDHGST:X	VDHGST:Y	VDHGST:Z	CGRDAC:X	GGRDAC:Y	GGRDAC:Z	PGDIAC:X	PGDIAC:Y
HULL	0.	0.	0.	0.	0.	C.	0.	C.	0.	0.
	MCTHAC:Z	VTGUST:X	VTGUST:Y	VTGUST:Z	UTGUST:X	CTGUST:Y	UTGUST:Z	DUGDXT	DUGDYT	DVGDYT
HULL		0.	0.	0.	0.	C.	0.	0.	0.	0.
	VDXTGT:X	VDXTGT:Y	VDXTGT:Z	UDTGST:X	UDTGST:Y	UDTGST:Z	VDTGST:X	VDTGST:Y	VDTGST:Z	PGDTAC:X
HULL	0.	0.	0.	C.	0.	C.	0.	C	C.	0.
	MGUTAC:Y	MGUTAC:Z	RVHLCV:X	RVHLCV:Y	RVHLCV:Z	RC LCV:X	RCHLCV:Y	RCHLCV:Z	CA[illegible]H	L[illegible]H
HULL	0.	0.	44.133	.3e120E-01	-.66426	0.	0.	0.	C.	3. [illegible]9
	ZETAM	ZMIUPM	RVTAIL:X	RVTAIL:Y	RVTAIL:Z	RCTAIL:X	RCTAIL:Y	RCTAIL:Z	ALT	P [illegible]
HULL	-3.0859	1.0706	43.539	.74702E-03	-.16725	C.	0.	C.	-.3219[illegible]E-02	-3.[illegible]
	BETAT	PDETAT	ALPTO	ALPT	PALPT	PALPTO	RHIVEL:X	RHIVEL:Y	RHIVEL:Z	PHIVEL
HULL	-.1[illegible]58E-02	-.1[illegible]2EL-02	0.	.10157E-02	.10157E-02	C.	-.13382	.20[illegible]9E-02	.65760	.3 [illegible]54
	PHIVEL:Y	PHIVEL:Z	RTIVEL:X	RTIVEL:Y	RTIVEL:Z	PTIVEL:X	PTIVEL:Y	PTI EL:Z	PC LWC	PC LWC
HULL	-.40732E-01	.31023E-01	.44053	.99195E-03	.15973	.20723E-01	-.12980E-02	.74947E-02	.67237[illegible]-01	.[illegible]12
	C [illegible] C	TIAC	TCCC	ZAVSOI	RHBFOR:X	RHBFOR:Y	RHBFOR:Z	STATOF:X	STATOF:Y	ST [illegible]
HULL	-30.017	1.0001	1.0000	-4.1410	0.	C.	-.11476[illegible]	C.	0.	-.11476
	GAMGFO:X	GAMGFO:Y	GAMGFO:Z	GGMGFO:X	GGMGFO:Y	GGM FO:Z	RHOWFO:X	RHOWFO:Y	RHOWFO:Z	RHOWFO:X
HULL	0.	0.	C.	0.	0.	0.	-805.60	-.79982	12.143	C.
	RHOWMO:Y	RHOWMO:Z	HGAAMF:X	HGAAMF:Y	HGAAMF:Z	HGAAMM:X	HGAAMM:Y	HGAAMF:Z	HGGAMF:X	HGGAMF:Y
HULL	-43661.	-2443.6	0.	0.	0.	0.	C.	C.	C.	C.
	HGGAMF:Z	HGGAMM:X	HGGAMM:Y	HGGAMM:Z	RHOGFO:X	RHOGFO:Y	RHOGFO:Z	RHOGMO:X	RHO MO:Y	RHOGMO:Z
HULL	0.	0.	0.	0.	0.	C.	0.	C.	C.	C.
	GHCIFO:X	GHCIFO:Y	GHCIFO:Z	GHCIMO:X	GHCIMO:Y	GHCIMO:Z	HCICFO:X	HCACFO:Y	HCACFO:Z	HCACMO:X
HULL	0.	[illegible]E-16	0.	0.	0.	C.	.52403E-C7	-.82C0[illegible]-01	.19917E-08	C.
	HCACMO:Y	HCACMO:Z	RHOAF :X	RHOAF :Y	RHOAF :Z	RHOAMO:X	RHOAMO:Y	RHOAMO:Z	HCA F :X	HCA F :Y
HULL	.60216E-05	-.2C9426-05	-805.60	-.79982	13.148	0.	-43661.	-2443.6	-80[illegible]	-.7[illegible]
	HOABF :Z	HOABMO:X	HOABMO:Y	HOABMO:Z	HCTAFO:X	HCTAFO:Y	HCTAFO:Z	HCTAMO:X	HCTAMO:Y	HC [illegible]
HULL	-.11475E+00	-13.301	-30[illegible].	-2443.6	-805.60	-.79982	-.11475E+C6	-13.301	-30[illegible]	-2443.
	TXFOR	TSYFOR	TDYFOR	TSZFOR	TSLMOM	TDLMOM	RTOWFO:X	RTOWFO:Y	RTOWFO:Z	RTOWMO:X
HULL	-261.41	6.0063	0.	25.291	6.7999	-237.83	-261.41	6.0063	25.[illegible]	-231.03
	RTOWMO:Y	RTOWMO:Z	TGAAMF:X	TGAAMF:Y	TGAAMF:Z	TGAAMM:X	TGAAMF:Y	TCAAMM:Z	TGGAMF:X	TGGAMF:Y
HULL	0.	0.	0.	0.	0.	0.	C.	C.	C.	C.
	TGGAMF:Z	TGGAMM:X	TGGAMM:Y	TGGAMM:Z	RTGGFO:X	RTGGFO:Y	RTGGFO:Z	RTC MO:X	RTGGMO:Y	RTGGMO:Z
HULL	0.	0.	0.	0.	0.	C.	0.	C.	C.	C.

CPU VARIABLES AT TIME = -.....

	U	V	W	PHID	THETD	PSID	X	Y	Z	
CPU1	13.991	0.	.40990	0.	0.	0.	37.895	-81.500	-96.[illegible]	0.
CPU2	13.991	0.	-.40990	0.	0.	0.	38.105	81.500	-96.[illegible]	0.
CPU3	13.991	0.	.40990	0.	0.	0.	-38.105	-81.500	-96.[illegible]	0.
CPU4	13.991	0.	-.40990	0.	0.	0.	-37.895	81.500	-96.[illegible]	0.

	THETA	PSI	XDOT	YDOT	GEAR IX	GEAR IY	GEAR IZ	IVSCP IX	IVSCP IY	IVSCP IZ
CPU1	.35000E-01	0.	17.279	73.368	36.000	-46.000	-951.31	I	I	
CPU2	-.35000E-01	0.	17.279	73.293	36.000	46.000	-951.31	I	I	
CPU3	.35000E-01	0.	7.279	73.368	-36.000	-46.000	-951.31	I	I	
CPU4	-.35000E-01	0.	17.279	73.293	-36.000	46.000	-951.31	I	I	

	VSURC IX	VSURC IY	VSURC IZ	VGUST IX	VGUST IY	VGUST IZ	RVLPU IX	RVLPU IY	RVLPU IZ	R[illegible]
CPU1	I	I	I	0.	0.	0.	43.973	0.	1.[illegible]397	52.[illegible]
CPU2	I	I	I	0.	0.	0.	43.973	0.	-1.[illegible]397	5[illegible].77
CPU3	I	I	I	0.	0.	0.	43.973	0.	1.[illegible]397	5[illegible].77
CPU4	I	I	I	0.	0.	0.	43.973	0.	-1.[illegible]397	5[illegible].[illegible]

	RVPUS IY	RVPUS IZ	RVRUT IX	RVRUT IY	RVRUT IZ	RVPRP IX	RVPRP IY	RVPRP IZ	RPIV IX	[illegible]
CPU1	-.40207E-01	-5.7136	43.973	0.	1.5397	44.384	-.40207E-01	-5.0946	-.41143	.40207E-
CPU2	-.40482E-01	-9.3332	43.973	0.	-1.5397	44.414	-.40482E-01	-9.1291	-.39119	.40482E-
CPU3	-.43070E-01	-8.2506	43.973	0.	1.5397	44.414	-.43070E-01	-8.5311	-.40070	.43070E-
CPU4	-.43323E-01	-9.[illegible]640	43.973	0.	-1.5397	44.384	-.43323E-01	-9.0617	-.39514	.43323 -

	RPIV IZ	RFIV IX	RFIV IY	RFIV IZ	PFIV IX	PFIV IY	PFIV IZ	LCSPE	CF.TS K	[illegible] FS
CPU1	7.5342	-.44140	.40207E-01	7.5342	-7.4776	0.	-.28097	3.6938	.341146E-02	1.0000
CPU2	7.5694	-.39119	.40482E-01	7.5894	-5.5632	0.	.20410	3.5974	.341[illegible]E-02	1.0000
CPU3	8.1708	-.44070	.43070E-01	8.1708	-7.9630	0.	-.28040	3.7113	.341[illegible]E-02	1.0000
CPU4	8.1221	-.39514	.43323E-01	8.1221	-5.5272	0.	.20285	3.7150	.342[illegible]E-02	1.0000

	LCSPE	DELTA P	DELP	STHCR	SALSR	SCSK	SCMGR	PTHCR	PALSP	PHISP
CPU1	3.7257	.000000E-02	1.0000	I	I	I	I	I	I	
CPU2	3.6481	.696605E-02	1.0000	I	I	I	I	I	I	
CPU3	3.7257	.000000E-02	1.0000	I	I	I	I	I	I	
CPU4	3.6473	.696604E-02	1.0000	I	I	I	I	I	I	

	THEOR	ASSK	BISK	OMEGR	STHEP	SCMGP	PTHLP	THEOP	CP.GP	TR
CPU1	.35316E-01	-.53286E-02	.54550E-01	23.250		I	I	.10188	129.66	2449.7
CPU2	.44781E-01	-.53286E-02	.44920E-01	23.250		I	I	.97070E-01	129.66	2422.4
CPU3	.44604E-01	-.53285E-02	.54550E-01	23.250		I	I	.10188	129.66	2600.7
CPU4	.47267E-01	-.53286E-02	.44920E-01	23.250		I	I	.97070E-01	129.66	2600.[illegible]

	GR	ROTPU IX	ROTPU IY	ROTPU IZ	ROTMU IX	RCTMU IY	RCTMU IZ	TP	CP	PR[illegible]FF IX
CPU1	5134.8	97.671	-1.0677	-2448.0	-292.75	-657.74	5127.0	158.99	201.43	15[illegible].84
CPU2	5[illegible]5.0	74.108	-1.4330	-2401.6	-254.24	-[illegible]7.82	5424.4	114.85	197.70	11[illegible].85
CPU3	5214.8	102.34	-1.1547	-2624.9	-292.40	-711.02	5208.8	151.99	201.42	15[illegible].82
CPU4	5552.5	77.993	-.77402	-2659.5	-253.89	-530.47	5527.0	114.39	197.[illegible]	11[illegible].7

	PRUPF IY	PRUPF IZ	PRUPM IX	PRUPM IY	PRUPM IZ	FUSFU IX	FUSFU IY	FUSFC IZ	FUSMU IX	FUSMC IY
CPU1	.78904E-02	7.0772	-200.30	-99.081	-7.1550	-60.320	.32494E-03	21.089	0.	0.
CPU2	.79519E-02	-2.6607	-187.59	30.410	6.0343	-55.391	.32940E-03	50.27[illegible]	0.	0.
CPU3	.84525E-02	7.[illegible]923	-200.29	-100.55	-7.1467	-60.355	.37287E-03	25.240	0.	0.
CPU4	.87760E-02	-2.4966	-187.42	34.515	6.0356	-55.384	.37726E-03	62.[illegible]67	0.	0.

	FUSMU IZ	JETMU	JETFU IX	JETFU IY	JETFU IZ	JETMU IX	JETMU IY	JETMC IZ	LPAFU IX	LPAFC IY
CPU1	0.	100.00	98.545	0.	-16.997	0.	-46[illegible].60	0.	299.9[illegible]	-1.[illegible]195
CPU2	0.	100.00	98.545	0.	-16.997	0.	-46[illegible].60	0.	232.0[illegible]	-1.[illegible]751
CPU3	0.	100.00	98.545	0.	-16.997	0.	-46[illegible].60	0.	302.[illegible]	-1.[illegible]46[illegible]
CPU4	0.	100.00	98.545	0.	-16.997	0.	-46[illegible].60	0.	232.[illegible]	-.7[illegible]6[illegible]

	LPAFL :Z	LPAFL :X	LPAMO :Y	LPAMO :Z	HGBLF :X	HGBLF :Y	HGBLF :Z	HGBLP :X	HGBLP :Y	HGBLP ..
LPU1	-2.26E+00	-4.97E-03	-1.42E-03	5.11E-01	0.	0.	0.	0.	0.	0.
LPU2	-2.49E+00	-4.98E-03	-9.12E-02	5.93E-01	0.	0.	0.	0.	0.	0.
LPU3	-2.20E+00	-4.97E-03	-1.21E-02	5.47E-01	0.	0.	0.	0.	0.	0.
LPU4	-2.31E+00	-4.96E-03	-9.01E-03	5.53E-01	0.	0.	0.	0.	0.	0.

	GCFAS	GCFAR :X	GCFAR :Y	GCFAR :Z	FRTMG	GFFUR :X	GFFUR :Y	GFFUR :Z	GFFCR :X	GFFCR :Y	GFFCR :Z	[illegible]
LPU1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
LPU2	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
LPU3	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
LPU4	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.

	GERAD :Z	HGRAD :X	HGRAD :Y	HGRAD :Z	CF :X	CF :Y	CF :Z	CM :X	CM :Y	CM :Z	[illegible]
LPU1	0.	0.	0.	0.	209.48	-1.01E+00	6547.0	-221.04	-11 3.2	51[illegible]	[illegible]
LPU2	0.	0.	0.	0.	317.51	-1.47E+00	6357.3	-636.03	-2559.3	5416[illegible]	[illegible]
LPU3	0.	0.	0.	0.	211.00	-1.14E+00	6374.2	-310.86	-1240.8	521[illegible]	[illegible]
LPU4	0.	0.	0.	0.	326.99	-1.70E+00	6366.4	-634.97	-2617.9	551[illegible]	[illegible]

	AUX	ALN	CLAVR	ALAVR	VT	TWING	RCTIV :X	RCTIV :Y	RCTIV :Z	[illegible]
LPU1	2.67E-04	2.76E-02	9.20E-02	2.25E-01	14.461	4.7160	-.25712	2.12E-01	4.7689	[illegible]
LPU2	2.24E-04	3.65E-02	9.93E-02	2.60E-01	14.557	4.7482	-.21325	2.70E-01	4.7414	[illegible]
LPU3	2.31E-04	3.01E-02	9.97E-02	2.27E-01	14.977	5.0516	-.27544	2.91E-01	5.0442	[illegible]
LPU4	2.60E-04	3.87E-02	1.03E-01	2.27E-01	15.070	5.0815	-.22821	2.70E-01	5.0763	[illegible]

	USALR	PUALR R	CLAVP	ALAVP	VTP	TWING	PDPIV :X	PDPIV :Y	PDPIV ..	[illegible]
LPU1	.99439	2.76E-06	-.90008E-01	-.24349E-01	15.749	4.9692	-4.0882	0.	-1.5[illegible]	1.1795
LPU2	1.0079	2.24E-04	-.33233E-01	-.91103E-02	13.185	3.8687	-3.8643	0.	-.12756	.[illegible]
LPU3	1.0065	2.31E-04	-.90035E-01	-.24349E-01	15.140	4.7803	-4.7772	0.	-.17529	1.1795
LPU4	1.0001	2.60E-04	-.33104E-01	-.90757E-02	13.359	3.8442	-3.8420	0.	-.12675	.[illegible]

	PUALR P	CLALT
LPU1	47.163	0.
LPU2	46.865	0.
LPU3	47.160	0.
LPU4	46.846	0.

TAIL AERODYNAMIC REVIMES ANGLE OF ATTACK - 1 ANGLE OF SIDESLIP - 1 ROLLING ANGLE OF ATTACK - 1

**********STABILITY DERIVATIVES AND EIGENVALUES FOR TRIM CASE 1**********

EQUATION FORM

A		B		C
		DUMMY		DUMMY
		DUMMY		DUMMY

UOUT
VOUT
WOUT
POUT
QOUT
ROUT
XOUT
YOUT
ZOUT
PHIOUT
THETAOUT
PSIOUT

A MATRIX

-.232E-01	.249E-02	-.113E-01	.269E+00	.110E+01	.670E-01	0.	0.	-.524E-10	.552E-03	-.140 +01	-.145E+0	
.961E-04	-.200E-01	.187E-03	-.644E+00	-.963E-01	.204E+01	0.	0.	.121E-12	.1 6F+01	.578E-02	.282E+0	
-.981E-02	.230E-01	-.141E+00	-.709E-01	-.317E+01	-.849E-01	0.	0.	.418E-09	.563E-03	-.326 +01	-.144E+0	
.539E-04	-.207E-02	-.301E-04	-.273E+00	.467E-02	.145E+00	0.	0.	-.565E-14	-.197E+00	-.776E-03	.145E+0	
-.402E-04	.194E-04	.232E-02	.211E-02	-.142E+00	-.136E-01	0.	0.	.723E-11	-.760E-04	-.315E-01	.7E3E-0	
.944E-05	-.810E-03	-.575E-04	-.363E-01	.352E-03	-.639E-01	0.	0.	-.665E-15	-.765E-02	-.173E-02	-.726E-0	
.100E+01	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	
0.	.100E+01	0.	0.	0.	0.	0.	0.	0.	0.	0.	.140E+0	
0.	0.	.100E+01	0.	0.	0.	0.	0.	0.	0.	-.140 +02	0.	
0.	0.	0.	.100E+01	0.	0.	0.	0.	0.	0.	0.	0.	
0.	0.	0.	0.	.100 +01	0.	0.	0.	0.	0.	0.	0.	
0.	0.	0.	0.	0.	.100E+01	0.	0.	0.	0.	0.	0.	

ORIGINAL PAGE IS
OF POOR QUALITY

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!   .636E+00   .166E-02   .468E+00   .205E-02   .151E+01   .137E-02 !   ! DTHEOR3 !
!  -.751E+00   .371E+00   .121E+00  -.240E-02   .107E+00   .977E-04 !   ! DA1SR3  !
!  -.964E+01   .157E-02   .673E+00  -.262E-01  -.618E-01  -.571E-04 !   ! DB1SR3  !
!   .332E+00  -.563E-02  -.327E-01   .907E-03   .163E-02   .141E-05 !   ! DBMEGR3 !
!  -.174E-01  -.212E-03   .122E-01  -.231E-03   .607E-02   .733E-05 !   ! DTHEOP3 !
!   .684E-02  -.314E-02   .644E-02   .361E-04   .138E-01   .171E-04 !   ! DBMEGP3 !
! 0.          0.          0.          0.          0.          0.       !   ---         ---
! 0.          0.          0.          0.          0.          0.       !
! 0.          0.          0.          0.          0.          0.       !
! 0.          0.          0.          0.          0.          0.       !
! 0.          0.          0.          0.          0.          0.       !
! 0.          0.          0.          0.          0.          0.       !
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!   .146E+01   .150E-02   .591E+00   .490E-02   .145E+01   .122E-04 !   ! LTHEOR4 !
!   .660E+00   .377E+00  -.121E+00   .238E-02  -.121E+00  -.102E-03 !   ! DA1SR4  !
!  -.899E+01   .204E-02   .691E+00  -.286E-01  -.333E-01  -.294E-04 !   ! DB1SR4  !
!  -.331E+00  -.569E-02   .326E-01  -.105E-02  -.118E-02  -.114E-05 !   ! DBMEGR4 !
!  -.907E-01  -.221E-03   .118E-01  -.267E-03   .826E-02   .697E-05 !   ! LTHEOP4 !
!  -.157E-01  -.312E-02  -.528E-02  -.395E-04  -.204E-01  -.172E-04 !   ! DBMEGP4 !
! 0.          0.          0.          0.          0.          0.       !   ---         ---
! 0.          0.          0.          0.          0.          0.       !
! 0.          0.          0.          0.          0.          0.       !
! 0.          0.          0.          0.          0.          0.       !
! 0.          0.          0.          0.          0.          0.       !
! 0.          0.          0.          0.          0.          0.       !
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!   .122E-04   .619E-02   .526E-05 !   ! DDELTAL  !
!   .937E-02   .101E-04  -.331E+00 !   ! DDELTCL  !
!   .125E-04  -.491E+00   .541E-05 !   ! DDELTRD  !
!  -.434E-02  -.476E-05  -.168E-02 !   ---          ---
!  -.108E-05  -.852E-02  -.724E-06 !
!  -.215E-05  -.232E-00   .463E-02 !
! 0.          0.          0.       !
! 0.          0.          0.       !
! 0.          0.          0.       !
! 0.          0.          0.       !
! 0.          0.          0.       !
! 0.          0.          0.       !
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.273E-02	-.241E-03	-.234E-02	-.430E-04	.618E+00	-.100E-03	0.	-.243E-05	-.142E-01	DSUTC
-.370E-04	.152E-01	-.465E-06	.437E+00	.103E-03	.262E+01	0.	.601E-01	-.237E-05	DSVTC
.280E-04	-.249E-06	.225E-01	.144E-04	-.308E+01	-.107E-03	0.	-.250E-05	.708E-01	DSWTC
.430E-06	.102E-04	.216E-05	.134E-01	-.479E-04	.378E-01	0.	.932E-03	.110E-05	DSPTC
-.120E-04	.333E-07	.392E-03	.661E-05	-.351E-01	.146E-04	0.	.335E-06	.195E-02	DSQTC
.334E-05	-.213E-03	.107E-07	-.591E-02	-.237E-05	-.567E-01	0.	-.130E-02	.544E-07	DSRTC
0.	0.	0.	0.	0.	0.	0.	0.	0.	[illegible]
0.	0.	0.	0.	0.	0.	0.	0.	0.	[illegible]
0.	0.	0.	0.	0.	0.	0.	0.	0.	[illegible]
0.	0.	0.	0.	0.	0.	0.	0.	0.	
0.	0.	0.	0.	0.	0.	0.	0.	0.	
0.	0.	0.	0.	0.	0.	0.	0.	0.	

-.601E-04	-.114E-02	-.317E-07	0.	0.	-.182E-08	DSPLTG
.186E+01	-.171E-06	.734E-03	0.	0.	.449E-04	DSQLTG
-.625E-04	-.117E-02	-.326E-07	0.	0.	-.187E-06	DSRLTG
.286E-01	.364E-07	.113E-04	0.	0.	.640E-0[illegible]	DSUGLXT
.110E-04	.157E-03	.437E-03	0.	0.	.250E-09	DSDLGDYT
-.255E-01	.437E-08	.132E-03	0.	0.	-.973E-06	DSDVGDYT
0.	0.	0.	0.	0.	0.	
0.	0.	0.	0.	0.	0.	
0.	0.	0.	0.	0.	0.	
0.	0.	0.	0.	0.	0.	
0.	0.	0.	0.	0.	0.	
0.	0.	0.	0.	0.	0.	

.347E-02	-.360E-01	.126E-02	.320E-02	.342E-01	-.930E-03	.289E-02	-.266E-01	-.141E-02	.2[illegible]3E-02	.282E-01	-.363E-0[illegible]	[illegible]
.214E-03	-.271E-02	.126E-02	-.353E-03	-.285E-02	-.135E-02	.212E-03	-.271E-02	.190E-02	-.315E-03	-.247E-02	-.190E-0[illegible]	[illegible]
.153E-02	-.253E-01	.252E-01	.194E-02	.119E-01	.250E-01	.151E-02	-.230E-01	.215E-01	.186E-02	.123E-01	.219E-01	[illegible]
-.450E-04	.767E-03	-.786E-03	.533E-04	.349E-03	.798E-03	-.525E-04	.840E-03	-.791E-03	.661E-04	.424E-03	.804E-0[illegible]	[illegible]
-.934E-05	.205E-03	-.275E-03	-.147E-04	-.619E-04	-.292E-03	.230E-04	-.321E-03	.232E-03	.253E-04	.192E-03	.214E-0[illegible]	[illegible]
.233E-04	-.269E-03	-.126E-04	-.297E-04	-.314E-03	.417E-04	.276E-04	-.274E-03	-.112E-04	-.283E-04	-.303E-03	.439E-0[illegible]	[illegible]
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	[illegible]
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	[illegible]
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	[illegible]
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	[illegible]
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	[illegible]
0.	.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	[illegible]

ORIGINAL PAGE IS
OF POOR QUALITY

[illegible] AUXILIARY MATRIX

-.602E+01	.167E+03	-.156E+02	.531E+03	.715E+03	.895E+04	0.	0.	-.648E-07	.175E+03	-.776E+04	-.831E+04	[illegible]
.116E+01	-.192E+02	.657E+00	-.201E+04	-.476E+02	-.240E+04	0.	0.	.795E-11	.630E+04	.201E+02	.175E+[illegible]	[illegible]
-.122E+02	.960E+02	-.101E+05	.712E+04	.908E+04	.114E+05	0.	0.	-.393E-07	-.449E+04	-.457E+04	-.551E+[illegible]	[illegible]
.957E+01	-.106E+03	.646E+01	-.633E+04	-.827E+03	-.120E+05	0.	0.	.114E-10	.208E+05	.192E+03	.923E+[illegible]	[illegible]
.311E+02	-.304E+03	-.962E+02	.370E+04	.608E+04	-.237E+05	0.	0.	-.553E-07	-.992E+03	.238E+05	.256E+0[illegible]	[illegible]
-.321E+01	.633E+02	-.325E+02	.451E+04	.139E+04	.391E+04	0.	0.	.182E-09	-.157E+03	-.975E+03	-.1[illegible]5E+04	[illegible]
-.724E+01	-.163E+03	-.127E+02	-.808E+02	.361E+03	-.841E+04	0.	0.	-.649E-07	-.174E+03	-.758E+04	.806E+0[illegible]	[illegible]
.114E+01	-.153E+02	.747E+00	-.253E+04	-.516E+02	-.211E+04	0.	0.	.715E-10	.638E+04	.21[illegible]E+02	.146E+0[illegible]	[illegible]
-.712E+01	-.246E+02	-.102E+03	-.718E+04	.935E+04	-.731E+04	0.	0.	-.355E-07	.443E+04	-.472E+04	.156E+0[illegible]	[illegible]
.930E+01	.435E+02	.754E+01	-.541E+04	-.903E+03	-.402E+04	0.	0.	.227E-09	.205E+05	.2[illegible]E+03	-.[illegible]7E+0[illegible]	[illegible]
.213E+02	.477E+03	-.646E+02	-.172E+04	.453E+04	.259E+05	0.	0.	-.911E-07	.[illegible]25E+02	.245E+05	-.236E+0[illegible]	[illegible]
-.153E-01	.236E+02	-.135E+02	-.409E+03	.702E+03	.225E+04	0.	0.	-.728E-09	.759E+03	-.[illegible]04E+03	.733E+[illegible]	[illegible]
-.608E+01	.167E+03	-.157E+02	.534E+03	.632E+03	-.310E+04	0.	0.	-.648E-07	.175E+03	-.779E+04	-.834E+04	
.130E+01	-.370E+02	-.435E+00	-.340E+04	-.690E+01	-.330E+04	0.	0.	.169E-09	.622E+04	-.1[illegible]E+02	.1[illegible]7E+[illegible]	
-.133E+02	.114E+03	-.151E+03	.727E+04	-.476E+03	-.833E+04	0.	0.	-.193E-05	-.443E+04	-.342E+04	-.671E+0[illegible]	
.104E+02	-.105E+03	.373E+01	-.373E+04	-.414E+03	-.617E+04	0.	0.	.443E-09	.203E+0[illegible]	.110E+03	.868E+0[illegible]	
.312E+02	-.303E+03	-.101E+03	.373E+04	.779E+03	.239E+05	0.	0.	-.115E-06	-.992E+03	.239E+05	.2[illegible]	
-.374E+01	.704E+02	-.341E+02	.502E+04	-.132E+04	.520E+0[illegible]	0.	0.	-.728E-09	-.140E+03	-.102E+04	-.194E+04	
-.721E+01	-.162E+03	-.127E+02	-.933E+02	.121E+04	.800E+04	0.	0.	-.648E-07	-.174E+03	-.758E+04	.806E+0[illegible]	
.128E+01	-.362E+02	-.381E+00	-.330E+04	-.755E+01	-.375E+04	0.	0.	.151E-09	.622E+04	-.123E+02	.128E+0[illegible]	
-.316E+01	-.394E+02	-.152E+03	-.733E+04	-.385E+03	.272E+04	0.	0.	-.192E-06	.449E+04	-.345E+04	.740E+04	
.101E+02	-.304E+02	.454E+01	-.770E+04	-.337E+03	-.170E+05	0.	0.	.387E-09	.205E+05	.146E+03	-.126E+04	
.219E+02	.473E+03	-.788E+02	-.182E+04	-.704E+02	-.227E+05	0.	0.	-.751E-07	.523E+02	.243E+05	-.236E+0[illegible]	
-.248E+00	.195E+02	-.152E+02	-.692E+03	-.550E+03	.256E+04	0.	0.	-.546E-09	.742E+03	-.455E+03	.866E+0[illegible]	

[illegible] PRIME AUXILIARY MATRIX

.607E+04	-.655E+0[illegible]	.462E+02	.226E+03	-.350E+04	.883E+04
.254E+02	.175E+04	-.448E+03	.153E+05	.242E+03	-.458E+04
.331E+04	-.465E+03	.578E+05	-.392E+05	-.640E+05	.804E+04
-.210E+04	.227E+05	-.248E+04	.354E+05	.187E+04	-.258E+05
-.309E+05	-.513E+04	.360E+05	-.265E+05	-.357E+05	-.596E+05
.756E+03	-.733E+03	-.313E+05	.259E+05	.306E+05	-.107E+04
.551E+04	.229E+02	-.315E+04	-.301E+04	.525E+03	-.816E+04
.245E+02	.162E+04	-.463E+03	.148E+05	.257E+03	-.450E+04
.349E+04	.464E+03	.572E+05	.382E+05	-.632E+05	-.821E+04
-.663E+04	.230E+05	-.742E+02	.341E+05	-.304E+03	.333E+04
-.226E+05	-.552E+04	.225E+05	.226E+05	-.294E+05	.522E+05
.213E+05	.702E+03	-.465E+05	-.388E+05	.398E+05	-.594E+04
.616E+04	-.603E+0[illegible]	.658E+02	.188E+03	-.477E+04	.923E+0[illegible]
-.191E+02	.1[illegible]E+04	-.136E+03	.163E+05	-.268E+03	-.206E+04
.257E+04	-.466E+05	.592E+05	-.393E+05	.658E+05	.803E+04
-.635E+04	.245E+05	-.179E+04	.387E+05	-.220E+04	-.185E+05
-.31[illegible]E+05	-.521E+04	.296E+05	-.261E+05	.258E+05	-.631E+05
.831E+03	-.846E+03	-.341E+05	.286E+05	-.335E+05	-.116E+04
.566E+04	.230E+02	-.313E+04	-.297E+04	-.468E+04	-.851E+04
-.260E+02	.201E+04	-.152E+03	.157E+05	-.[illegible]E+03	-.196E+04
.276E+04	.483E+03	.566E+05	.360E+05	.[illegible]E+05	-.835E+04
-.623E+04	.246E+05	.767E+03	.363E+05	.347E+03	.112E+05
-.234E+05	-.562E+04	.220E+05	.222E+05	.187E+05	.504E+05
.239E+05	.825E+03	-.433E+05	-.414E+05	-.428E+05	-.566E+04

LODCNTL
DVDCNTL
[illegible]CNTL
DPCCNTL
D[illegible]CNTL
LRCCNTL

b AUXILIARY MATRIX

-.650E+03	-.752E+02	.207E+04	-.139E+01	.627E+04	.569E+01	LTHEOR1
.405E+04	.225E+04	-.470E+03	.947E+01	-.212E+03	-.193E+00	LAISR1
-.570E+03	-.111E+03	.577E+04	-.156E+03	.969E+02	.802E-01	LBISR1
.104E+05	.239E+05	-.642E+04	.659E+01	-.426E+04	-.559E+01	DUPEGR1
-.309E+05	-.471E+04	-.200E+05	-.821E+02	-.234E+05	-.211E+02	LTHEOP1
.296E+05	-.355E+03	.128E+04	.448E+03	-.719E+03	-.653E+00	DCMEGP1
-.970E+03	.741E+02	.642E+02	-.242E+01	-.952E+02	-.867E-01	
.376E+04	-.195E+03	-.455E+03	.102E+02	-.213E+03	-.194E+00	
-.334E+04	.105E+03	.357E+03	-.915E+01	.687E+02	.644E-01	
.649E+04	-.541E+03	-.108E+04	.229E+02	-.632E+03	-.575E+00	
-.130E+04	-.246E+03	.760E+02	-.441E+01	-.505E+02	-.461E-01	
.469E+03	-.159E+03	-.316E+03	.781E+00	-.761E+03	-.691E+00	
-.131E+04	-.754E+02	-.165E+03	-.388E+01	-.952E+03	-.865E+00	
.393E+04	-.123E+03	-.330E+03	.107E+02	.138E+03	.169E+00	
.927E+04	-.105E+03	-.933E+03	.253E+02	-.332E+02	-.316E-01	
.694E+04	-.332E+03	-.713E+03	.249E+02	.528E+03	.475E+00	
.252E+03	.223E+03	.623E+03	.166E+01	.252E+04	.229E+01	
-.165E+04	-.116E+03	-.163E+03	-.334E+01	-.762E+03	-.691E+00	
-.970E+03	.791E+02	.642E+02	-.242E+01	-.952E+02	-.867E-01	
.393E+04	-.123E+03	-.330E+03	.103E+02	.166E+03	.166E+00	
-.580E+04	.109E+03	.552E+03	-.159E+02	-.106E+03	-.942E-01	
.695E+04	-.325E+03	-.701E+03	.249E+02	.565E+03	.511E+00	
-.110E+04	-.240E+03	.556E+02	-.371E+01	-.322E+02	-.294E-01	
.405E+03	-.152E+03	-.303E+03	.353E+00	-.719E+03	-.653E+00	

-.109E+04	-.777E+0[illegible]	.391E+02	-.3[illegible]E+01	-.387E+02	-.326E-01	LTHEOR2
-.[illegible]E+04	-.198E+03	.442E+03	-.1[illegible]E+02	.236E+03	.198E+00	LAISR2
-.328E+04	-.111E+03	.343E+03	-.968E+01	.638E+02	.511E-01	LBISR2
-.620E+04	-.557E+03	.105E+04	-.247E+02	.741E+03	.622E+00	DUMEGR2
-.190E+04	.230E+03	.160E+03	-.505E+01	-.159E+03	-.161E+00	LTHEOP2
.132E+04	-.112E+03	.112E+03	.369E+01	.777E+03	.657E+00	DCMEGP2
.255E+04	.824E+02	.176E+04	.955E+01	.597E+04	.504E+01	
-.342E+04	.229E+04	.419E+03	-.113E+02	.237E+03	.199E+00	
-.568E+05	.107E+03	.581E+04	-.171E+03	.267E+03	.223E+00	
-.870E+04	.243E+05	-.463E+04	-.691E+02	-.[illegible]E+04	-.407E+01	
-.245E+05	-.50[illegible]E+04	-.210E+05	-.209E+02	-.[illegible]E+05	-.123E+02	
.397E+05	.7[illegible]E+03	.532E+03	.470E+03	[illegible]	.6[illegible]E+00	
-.109E+04	-.777E+02	.691E+02	-.349E+01	-.[illegible]E+02	-.3[illegible]E-01	
-.400E+04	-.124E+03	.338E+03	-.119E+02	-.196E+03	-.16[illegible]E+00	
-.583E+04	-.107E+03	.550E+03	-.175E+02	-.102E+03	-.869E-01	
-.914E+04	-.335E+03	.738E+03	-.270E+02	-.555E+03	-.47[illegible]E+00	
-.217E+04	.231E+03	.182E+03	-.580E+01	-.207E+03	-.176E+00	
.130E+04	-.120E+03	.122E+03	.377E+01	.623E+03	.695E+00	
-.176E+04	.8[illegible]6E+02	-.134E+03	-.518E+01	-.766E+03	-.210E+00	
-.400E+04	-.124E+03	.338E+03	-.119E+02	-.195E+03	-.166E+00	
.917E+04	.170E+03	-.929E+03	.275E+02	-.450E+02	-.348E-01	
-.917E+04	-.322E+03	.728E+03	-.271E+02	-.595E+03	-.507E+00	
-.449E+03	-.247E+03	.691E+03	-.184E+01	.259E+04	.218E+01	
-.191E+03	-.15[illegible]	.263E+03	-.848E+00	.779E+03	.658E+00	

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AUXILIARY MATRIX

-.233E+01	-.497E+02	.233E+02	.267E+00	-.751E+02	-.509E+02	-.224E+03	-.351E+02	.167E+02
-.112E-01	-.253E+02	.225E-01	.118E-01	.522E-01	-.264E+03	-.254E-01	-.205E+03	-.116E-01
.850E-01	.471E+01	-.345E+02	-.420E+01	.411E+03	.151E+03	-.511E+02	.120E+03	-.247E+03
-.671E-01	-.806E+02	.690E-01	.262E-01	.116E+00	-.853E+03	-.504E-01	-.601E+03	-.257E-01
.860E+01	.149E+03	.305E+02	-.511E-01	-.606E+02	.192E+03	.622E+03	.110E+03	-.357E+01
-.719E-01	-.934E+02	.490E-01	-.446E-02	-.197E-01	-.811E+02	.961E-02	-.446E+02	.439E-02
-.225E+01	.497E+02	.233E+02	.267E+00	-.751E+02	.509E+02	-.224E+03	.351E+02	.167E+02
-.213E-01	-.254E+02	.225E-01	.118E-01	.522E-01	-.265E+03	-.254E-01	-.205E+03	-.116E-01
.966E-01	.481E+01	-.340E+02	-.431E+01	.417E+03	-.151E+03	-.519E+02	-.120E+03	-.267E+03
-.833E-01	-.737E+02	.669E-01	.263E-01	.116E+00	-.843E+03	-.505E-01	-.595E+03	-.258E-01
.853E+01	-.149E+03	.373E+02	-.642E+00	-.133E+03	-.181E+03	.839E+03	-.927E+02	.725E+02
-.765E-01	-.803E+02	.140E-01	.314E-03	.139E-02	-.122E+03	-.677E-03	-.755E+02	-.309E-03
-.233E+01	-.497E+02	.233E+02	.267E+00	-.751E+02	-.509E+02	-.224E+03	-.351E+02	.167E+02
.207E-01	.210E+02	.148E-01	.129E-01	.571E-01	-.215E+03	-.279E-01	-.172E+03	-.127E-01
-.383E-01	.470E+01	-.207E+02	-.363E+01	.239E+03	.151E+03	.349E+02	.120E+03	-.227E+03
.925E-01	.506E+02	.859E-01	.279E-01	.131E+00	-.838E+03	-.502E-01	-.503E+03	-.290E-01
.879E+01	.149E+03	.303E+02	.190E-01	-.355E+02	.192E+03	.838E+03	.110E+03	.580E+03
-.731E-01	-.393E+02	.154E-01	-.459E-02	-.202E-01	-.866E+02	.987E-02	-.462E+02	.455E-02
-.225E+01	.497E+02	.233E+02	.269E+00	-.751E+02	.508E+02	-.224E+03	.351E+02	.167E+02
.206E-01	.209E+02	.143E-01	.129E-01	.571E-01	-.210E+03	-.279E-01	-.172E+03	-.127E-01
-.455E-01	-.402E+01	.206E+02	-.300E+01	.234E+03	-.151E+03	.347E+02	-.120E+03	-.227E+03
.926E-01	.836E+02	.859E-01	.290E-01	.131E+00	-.843E+03	-.498E-01	-.506E+03	-.291E-01
.855E+01	-.149E+03	.320E+02	.770E+00	-.435E+03	-.181E+03	.839E+03	-.927E+02	.483E+02
-.719E-01	-.834E+02	.432E-01	.432E-03	.491E-02	-.117E+03	-.520E-03	-.731E+02	-.424E-03

0.	-.131E+04	-.279E+04	.411E+04	-.134E+01	-.504E+00
0.	.709E+00	-.139E+04	.467E+00	-.152E-03	-.349E+01
0.	.185E+04	-.239E+03	.954E+03	-.310E+00	-.192E+01
0.	.202E+01	-.443E+04	.104E+01	-.337E-03	-.108E+02
0.	-.211E+04	-.834E+04	-.154E+05	.302E+01	-.149E+01
0.	.242E-01	-.496E+04	.124E-01	-.405E-03	-.123E+01
0.	-.131E+04	-.279E+04	.411E+04	-.134E+01	-.504E+00
0.	.795E+00	.122E+04	.512E+00	-.166E-03	-.277E+01
0.	-.175E+04	-.239E+03	-.641E+03	.208E+00	-.192E+01
0.	.227E+01	.343E+04	.117E+01	-.332E-03	-.960E+01
0.	-.205E+04	-.839E+04	-.154E+05	.301E+01	-.149E+01
0.	-.352E+03	-.498E+04	-.181E+00	.390E-04	-.775E+00
0.	-.131E+04	-.279E+04	.411E+04	-.134E+01	-.504E+00
0.	.795E+00	.122E+04	.512E+00	-.166E-03	-.277E+01
0.	-.124E+04	-.239E+03	-.638E+03	.206E+00	-.192E+01
0.	.222E+01	.307E+04	.117E+01	-.332E-03	-.960E+01
0.	-.179E+04	-.834E+04	-.153E+05	.495E+01	-.149E+01
0.	.332E-01	-.498E+04	.171E-01	-.550E-05	-.117E+01

ORIGINAL PAGE IS OF POOR QUALITY

-.638E+00	.484E+01	-.351E+01	.134E+03	.764E+03	.129E+04	0.	.297E+02	-.175E+02
.954E-02	-.105E+01	.239E-02	.874E+02	-.531E+00	.256E+03	0.	.656E+01	.122E-01
-.131E+00	.196E+01	-.215E+01	.304E+03	-.406E+02	.661E+03	0.	.192E+02	.923E+01
.243E-01	-.305E+01	.530E-02	.134E+03	-.118E+01	.592E+03	0.	.135E+02	.270E-01
.240E+01	-.143E+02	-.537E+01	-.371E+03	.111E+04	-.370E+04	0.	-.865E+02	-.256E+02
-.227E-01	.839E+01	-.504E-03	.209E+03	.201E+00	.216E+04	0.	.497E+02	-.461E-02
-.613E+00	-.454E+01	-.351E+01	-.135E+03	.763E+03	-.129E+04	0.	-.297E+02	-.175E+0
.951E-02	-.103E+01	.239E-02	.878E+02	-.531E+00	.269E+03	0.	.663E+01	.122E-01
-.152E+00	-.196E+01	-.213E+01	-.304E+03	-.434E+02	-.661E+03	0.	-.198E+02	.598E+0[illegible]
.254E-01	-.407E+01	.532E-02	.142E+03	-.118E+01	.460E+03	0.	.110E+02	.271E-01
.230E+01	.147E+02	-.493E+01	.435E+03	.112E+04	.396E+04	0.	.310E+02	-.258E+0[illegible]
-.197E-01	.835E+01	.630E-04	.256E+03	-.141E-01	.230E+04	0.	.525E+02	.324E-0[illegible]
-.638E+00	.464E+01	-.351E+01	.134E+03	.764E+03	.129E+04	0.	.297E+02	-.175E+02
.210E-01	-.556E+01	.202E-02	-.330E+02	-.581E+00	-.914E+03	0.	-.211E+02	.133 -01
.130E+00	.196E+01	-.105E+02	.304E+03	.177E+04	.661E+03	0.	.198E+02	-.400E+02
.566E-01	-.172E+02	.598E-02	-.223E+03	-.133E+01	-.302E+04	0.	-.694E+02	.305E-01
.243E+01	-.143E+02	-.625E+01	-.372E+03	.130E+04	-.376E+04	0.	-.865E+02	-.300E+02
-.239E-01	.356E+01	-.927E-03	.222E+03	.206E+00	.229E+04	0.	.528E+02	-.473E-0[illegible]
-.613E+00	-.454E+01	-.351E+01	-.135E+03	.763E+03	-.129E+04	0.	-.297E+02	-.175E+02
.210E-01	-.555E+01	.202E-02	-.377E+02	-.581E+00	-.916E+03	0.	-.216E+02	.133E-01
.116E+00	-.172E+01	-.105E+02	-.304E+03	.176E+04	-.801E+03	0.	-.198E+02	-.405E+02
.597E-01	-.176E+02	.600E-02	-.234E+03	-.133E+01	-.313E+04	0.	-.720E+02	.306E-01
.233E+01	.147E+02	-.405E+01	.435E+03	.934E+03	.396E+04	0.	.910E+02	-.214E+02
-.165E-01	.788E+01	.674E-04	.243E+03	-.194E-01	.216E+04	0.	.500E+02	.445E-0[illegible]

DSUTG
DSVTG
DSWTG
DSPTG
DSQTG
DSRTG
DSULTG
DSVLTG
DSWLTG

.581E+03	-.141E+01	-.301E+01	0.	0.	.222E-01
.250E+03	.979E-03	-.149E+01	0.	0.	.496E-02
.651E+03	.199E+01	.258E+00	0.	0.	.146E-01
.543E+03	.217E-02	-.472E+01	0.	0.	.102E-01
-.167E+04	-.166E+01	.965E+01	0.	0.	-.649E-01
.940E+03	-.370E-03	-.505E+01	0.	0.	.371E-01
-.581E+03	-.141E+01	.301E+01	0.	0.	-.222E-01
.257E+03	.979E-03	-.150E+01	0.	0.	.496E-02
-.651E+03	.200E+01	-.258E+00	0.	0.	-.146E-01
.497E+03	.218E-02	-.446E+01	0.	0.	.823E-02
.161E+04	-.226E+01	-.699E+01	0.	0.	.660E-01
.165E+04	.231E-04	-.534E+01	0.	0.	.395E-01
.581E+03	-.141E+01	-.301E+01	0.	0.	.222E-01
-.286E+03	.107E-02	.131E+01	0.	0.	-.150E-01
.651E+03	-.134E+01	.258E+00	0.	0.	.146E-01
-.160E+04	.245E-02	.309E+01	0.	0.	-.516E-01
-.167E+04	-.221E+01	.965E+01	0.	0.	-.649E-01
.100E+04	-.350E-03	-.535E+01	0.	0.	.393E-01
-.581E+03	-.141E+01	.301E+01	0.	0.	-.222E-01
-.285E+03	.107E-02	.130E+01	0.	0.	-.157E-01
-.651E+03	-.134E+01	-.258E+00	0.	0.	-.143E-01
-.113E+04	.246E-02	.396E+01	0.	0.	-.530E-01
.161E+04	-.172E+01	-.699E+01	0.	0.	[illegible]
.100E+04	.358E-04	-.505E+01	0.	0.	.374E-01

LSPUTG
LSQUTG
LSRUTG
LSUUGCXT
LSUUGDYT
LSDVGDYT

BECAUSE OF STRONG NONLINEARITIES THE FOLLOWING ENTRIES IN THE ABOVE MATRICES ARE NOT VALID.
THE DERIVATIVES AT THE POSITIVE AND NEGATIVE INCREMENTS ARE PRINTED TO INDICATE THE NATURE OF THE NONLINEARITY.

MATRIX	ROW POSITION	COLUMN POSITION	POSITIVE INCREMENT DERIVATIVE	NEGATIVE INCREMENT DERIVATIVE
A MATRIX	1	1	-.2317E-01	-.2315E-01
A MATRIX	3	1	-.6711E-02	-.6720E-02
A MATRIX	5	1	-.1615E-04	-.1820E-04
A MATRIX	1	2	.1296E+00	-.1247E+00
A MATRIX	2	2	-.2031E-01	-.1960E-01
A MATRIX	3	2	.9657E-01	-.4851E-01
A MATRIX	4	2	-.3921E-02	-.1822E-02
A MATRIX	5	2	.2322E-03	-.7713E-03
A MATRIX	6	2	-.8816E-03	-.7379E-03
A MATRIX	1	3	-.1135E-01	-.1130E-01
A MATRIX	3	3	-.1412E+00	-.1411E+00
A MATRIX	4	3	-.3616E-04	-.3601E-04
A MATRIX	6	3	-.5792E-04	-.5743E-04
A MATRIX	2	4	-.6437E+00	-.6440E+00
A MATRIX	3	4	-.6947E-01	-.7160E-01
A MATRIX	4	4	-.2782E+00	-.2781E+00
A MATRIX	6	4	-.3625E-01	-.3620E-01
A MATRIX	2	5	-.6624E-01	-.6631E-01
A MATRIX	3	5	-.3163E+01	-.3162E+01
A MATRIX	5	5	-.1421E+00	-.1421E+00
A MATRIX	1	6	.7329E+01	-.7194E+01
A MATRIX	3	6	.4107E+01	-.4270E+01
A MATRIX	4	6	.9678E-01	.1936E+00
A MATRIX	5	6	-.1297E-02	-.2967E-01
A MATRIX	6	6	-.6801E-01	-.6978E-01
A MATRIX	3	10	-.4426E-03	.1578E-02
A MATRIX	4	10	-.1969E+00	-.1969E+00
A MATRIX	5	10	-.7388E-04	-.7613E-04
A MATRIX	6	10	-.7647E-02	-.7647E-02
A MATRIX	1	11	-.1002F+01	-.1003E+01
A MATRIX	3	11	-.3261E+01	-.3285E+01
A MATRIX	4	11	-.9779E-03	-.9731E-03
A MATRIX	5	11	-.8154E-01	-.8153E-01
A MATRIX	6	11	-.1729E-02	-.1727E-02
A MATRIX	7	11	-.9660E-02	.1000E-02
A MATRIX	9	11	-.1400E+02	-.1400E+02
A MATRIX	1	12	.7163E+01	-.7413E+01
A MATRIX	3	12	.2757E+01	-.5633E+01
A MATRIX	4	12	.9647E-01	.1935E+00
A MATRIX	5	12	.1491E-01	-.1336E-01
A MATRIX	6	12	-.1131E-01	-.1090E-01
A MATRIX	7	12	-.9600E-02	.1000E-02
A AUXILIARY MATRIX	1	1	-.6019E+01	-.6021E+01
A AUXILIARY MATRIX	3	1	-.1.191E+02	-.1223E+02
A AUXILIARY MATRIX	7	1	-.7206E+01	-.7244E+01
A AUXILIARY MATRIX	9	1	-.7161E+01	-.7147E+01
A AUXILIARY MATRIX	13	1	-.8079E+01	-.8079E+01

m AUXILIARY MATRIX	15	1	-.1369E+02	-.1331E+
m AUXILIARY MATRIX	19	1	-.7214E+01	-.7212E+01
m AUXILIARY MATRIX	21	1	-.8149E+01	-.8188E+01
m AUXILIARY MATRIX	1	2	.2796E+03	.2842E+02
m AUXILIARY MATRIX	2	2	-.3070E+02	-.7744E+01
m AUXILIARY MATRIX	3	2	.2206E+03	-.7353E+02
m AUXILIARY MATRIX	4	2	-.2037E+03	-.1250E+02
m AUXILIARY MATRIX	5	2	-.9734E+03	-.1541E+03
m AUXILIARY MATRIX	6	2	.9746E+02	.2906E+ 2
m AUXILIARY MATRIX	7	2	-.5908E+02	-.2614E+03
m AUXILIARY MATRIX	8	2	-.2472E+02	-.1953E+01
m AUXILIARY MATRIX	9	2	.5467E+02	-.1030E+03
m AUXILIARY MATRIX	10	2	-.5062E+02	.1376E+03
m AUXILIARY MATRIX	11	2	.1056E+03	.7902E+02
m AUXILIARY MATRIX	12	2	.2062E+03	.4259E+ 2
m AUXILIARY MATRIX	14	2	-.5047E+02	-.2345E+ 2
m AUXILIARY MATRIX	15	2	.2341E+03	-.2593E+02
m AUXILIARY MATRIX	16	2	-.2705E+03	-.1492E+02
m AUXILIARY MATRIX	17	2	-.9729E+03	-.1532E+03
m AUXILIARY MATRIX	18	2	.1101E+03	.9073E+02
m AUXILIARY MATRIX	19	2	-.5962E+02	-.7659E+03
m AUXILIARY MATRIX	20	2	-.4350E+02	-.1869E+02
m AUXILIARY MATRIX	21	2	.4932E+02	-.1283E+03
m AUXILIARY MATRIX	22	2	-.1072E+03	.9980E+02
m AUXILIARY MATRIX	23	2	.1047E+03	.7919E+03
m AUXILIARY MATRIX	24	2	.2345E+02	.1551E+0
m AUXILIARY MATRIX	1	3	-.1956E+02	-.1957E+02
m AUXILIARY MATRIX	3	3	-.1009E+03	-.1008E+03
m AUXILIARY MATRIX	5	3	-.9617E+02	-.9617E+02
m AUXILIARY MATRIX	6	3	-.3281E+02	-.3217E+02
m AUXILIARY MATRIX	7	3	-.1269E+02	-.1269E+02
m AUXILIARY MATRIX	9	3	-.1018E+03	-.1015E+03
m AUXILIARY MATRIX	11	3	-.8455E+02	-.8461E+02
m AUXILIARY MATRIX	12	3	-.1308E+02	-.1312E+02
m AUXILIARY MATRIX	13	3	-.1960E+02	-.1967E+02
m AUXILIARY MATRIX	14	3	-.4330E+00	-.4361E+00
m AUXILIARY MATRIX	15	3	-.1914E+03	-.1912E+03
m AUXILIARY MATRIX	17	3	-.1009E+03	-.1009E+03
m AUXILIARY MATRIX	18	3	-.3444E+02	-.3374E+02
m AUXILIARY MATRIX	19	3	-.1671E+02	-.1278E+02
m AUXILIARY MATRIX	20	3	-.3776E+ 0	-.3831E+00
m AUXILIARY MATRIX	21	3	-.1962E+03	-.1928E+03
m AUXILIARY MATRIX	23	3	-.7881E+02	-.7987E+02
m AUXILIARY MATRIX	24	3	-.1551E+02	-.1483E+02
m AUXILIARY MATRIX	2	4	-.2644E+04	-.2512E+04
m AUXILIARY MATRIX	4	4	-.6[illegible]14E+04	-.6243[illegible]+04
m AUXILIARY MATRIX	7	4	-.8777E+02	-.8584E+02
m AUXILIARY MATRIX	8	4	-.2949E+04	-.2[illegible]6[illegible]E+04
m AUXILIARY MATRIX	9	4	-.7667E+04	-.71[illegible]E+04
m AUXILIARY MATRIX	10	4	-.5318E+04	-.5[illegible]E+04
m AUXILIARY MATRIX	11	4	-.1912E+04	-.1924E+04
m AUXILIARY MATRIX	12	4	-.[illegible]E+03	-.4361
m AUXILIARY MATRIX	14	4	-.[illegible]	-.[illegible]

A AUXILIARY MATRIX	16	4	-.8066E+04	-.8E96E+04
A AUXILIARY MATRIX	19	4	-.5425E+02	-.6237E+02
A AUXILIARY MATRIX	20	4	-.3269E+04	-.3371E+04
A AUXILIARY MATRIX	21	4	-.7313E+04	-.7337E+04
A AUXILIARY MATRIX	22	4	-.7606E+04	-.7796E+04
A AUXILIARY MATRIX	23	4	-.1815E+04	-.1832 +04
A AUXILIARY MATRIX	24	4	-.7316E+03	-.8531E+03
A AUXILIARY MATRIX	6	5	-.4723E+02	-.4792E+02
A AUXILIARY MATRIX	9	5	-.8237E+03	-.8711E+03
A AUXILIARY MATRIX	8	5	-.5127E+02	-.5203 +
A AUXILIARY MATRIX	10	5	-.8924E+03	-.9077E+03
A AUXILIARY MATRIX	14	5	-.7152E+01	-.7657E+ 1
A AUXILIARY MATRIX	15	5	-.4078E+03	-.4 E+
A AUXILIARY MATRIX	16		-.4164E+03	-.4121E+03
A AUXILIARY MATRIX	18	5	-.1311E+04	-.1311E+04
A AUXILIARY MATRIX	20	5	-.7775E+01	-.7315+01
A AUXILIARY MATRIX	21	5	-.2747E+03	-.2757E+03
A AUXILIARY MATRIX	22	5	-.3505E+03	-.3954E+03
A AUXILIARY MATRIX	23	5	-.3293E+02	-.1076E+03
A AUXILIARY MATRIX	24	5	-.9502E+03	-.9417E+03
A AUXILIARY MATRIX	1	6	.1941E+05	.2476E+05
A AUXILIARY MATRIX	2	6	-.3067E+04	-.1708E+04
A AUXILIARY MATRIX	3	6	.1879E+ 5	.3984E+05
A AUXILIARY MATRIX	4	6	-.1757E+05	-.6796E+04
A AUXILIARY MATRIX	5	6	-.5226E+05	-.5151E+04
A AUXILIARY MATRIX	6	6	.5867E+04	.1946E+04
A AUXILIARY MATRIX	7	6	-.2440E+04	-.1437E+03
A AUXILIARY MATRIX	8	6	-.2732E+04	-.149 E+04
A AUXILIARY MATRIX	9	6	-.2032E+04	-.3179E+05
A AUXILIARY MATRIX	10	6	-.9915E+04	.4796E+03
A AUXILIARY MATRIX	11	6	.7887E+04	.4390E+05
A AUXILIARY MATRIX	13	6	-.1088E+04	-.1451E+05
A AUXILIARY MATRIX	14	6	-.4108E+04	-.2490E+04
A AUXILIARY MATRIX	15	6	-.3005E+03	-.1635E+05
A AUXILIARY MATRIX	16	6	-.1226E+05	-.7510E+02
A AUXILIARY MATRIX	17	6	.5046E+04	.5218E+05
A AUXILIARY MATRIX	18	6	.2743E+04	-.1737E+04
A AUXILIARY MATRIX	19	6	.1306E+ 5	.2137E+04
A AUXILIARY MATRIX	20	6	-.4403E+04	-.3016 +04
A AUXILIARY MATRIX	21	6	.8024E+04	-.2194E+04
A AUXILIARY MATRIX	22	6	-.2277E+05	-.1117E+05
A AUXILIARY MATRIX	23	6	-.4047E+05	-.4904 +04
A AUXILIARY MATRIX	3	10	-.4492E+04	-.4486 + 4
A AUXILIARY MATRIX	5	10	-.9928E+03	-.9915E+03
A AUXILIARY MATRIX	6	10	-.1566E+03	-.1 66E+ 3
A AUXILIARY MATRIX	7	10	-.1735E+03	-.1736 + 3
A AUXILIARY MATRIX	15	10	-.4471E+04	-.4479E+ 4
A AUXILIARY MATRIX	17	10	-.9967E+ 3	-.9916E+
A AUXILIARY MATRIX	18	10	-.1391E+03	-.1395E+ 3
A AUXILIARY MATRIX	19	10	-.1735E+03	-.1735E+03
A AUXILIARY MATRIX	1	11	-.7782E+04	-.7783E+04
A AUXILIARY MATRIX	3	11	-.4696E+04	-.4681E+04

A AUXILIARY MATRIX	6	11	-.9805E+03	-.[illegible]
A AUXILIARY MATRIX	7	11	-.7576E+04	-.7577[illegible]
A AUXILIARY MATRIX	8	11	-.4727E+04	-.4712E+04
A AUXILIARY MATRIX	12	11	-.4092E+03	-.2986E+03
A AUXILIARY MATRIX	13	11	-.7785E+04	-.7786E+04
A AUXILIARY MATRIX	14	11	-.1394E+[illegible]	-.1393E+[illegible]
A AUXILIARY MATRIX	15	11	-.3424E+04	-.3404E+[illegible]
A AUXILIARY MATRIX	16	11	-.1023E+04	-.1017.+[illegible]
A AUXILIARY MATRIX	19	11	-.7577E+04	-.7577E+04
A AUXILIARY MATRIX	20	11	-.1234E+02	-.1234E+02
A AUXILIARY MATRIX	21	11	-.3457E+[illegible]	-.[illegible]
A AUXILIARY MATRIX	24	11	-.4605E+03	-.4467E+[illegible]
A AUXILIARY MATRIX	1	12	-.1056E+04	-.1473E+03
A AUXILIARY MATRIX	2	12	.1134E+04	.[illegible]
A AUXILIARY MATRIX	3	12	.1010E+04	-.13[illegible]
A AUXILIARY MATRIX	4	12	.2765E+[illegible]	.137[illegible]
A AUXILIARY MATRIX	5	12	.[illegible]	.[illegible]
A AUXILIARY MATRIX	6	12	.3036E+03	-.[illegible]
A AUXILIARY MATRIX	7	12	.1400E+05	.71[illegible]
A AUXILIARY MATRIX	8	12	.8006E+03	.7111E+04
A AUXILIARY MATRIX	9	12	.8075E+[illegible]	-.2495E+04
A AUXILIARY MATRIX	10	12	-.5411E+04	.4830E+04
A AUXILIARY MATRIX	11	12	-.4147E+05	-.5664E+04
A AUXILIARY MATRIX	13	12	-.1888E+04	-.1480E+05
A AUXILIARY MATRIX	14	12	.8987E+03	.2444E+04
A AUXILIARY MATRIX	15	12	.1293E+04	-.1472[illegible]
A AUXILIARY MATRIX	16	12	.2058E+04	.1411E+05
A AUXILIARY MATRIX	17	12	.5147E+04	.[illegible]
A AUXILIARY MATRIX	18	12	.3206E+03	-.4203E+04
A AUXILIARY MATRIX	19	12	.1397E+05	.2155E+04
A AUXILIARY MATRIX	20	12	.5156E+03	.2047E+04
A AUXILIARY MATRIX	21	12	.7474E+04	-.2867E+04
A AUXILIARY MATRIX	22	12	-.7173E+04	.4653E+04
A AUXILIARY MATRIX	23	12	-.4105E+05	-.5705E+04
A AUXILIARY MATRIX	24	12	.1069E+04	.6318E+03
B MATRIX	1	1	-.4762E+00	-.4713E+00
B MATRIX	2	1	-.7646E+00	-.7658E+00
B MATRIX	3	1	-.1062E+02	-.1059E+02
B MATRIX	3	2	.2353E-02	.[illegible]
B MATRIX	4	2	-.4732E-02	-.4674E-02
B MATRIX	5	2	-.2102E-03	-.[illegible]
B MATRIX	4	3	-.3273E-01	-.[illegible]
B MATRIX	5	3	-.4104E-02	-.[illegible]
B MATRIX	1	4	-.1138E-02	-.1138E-02
B MATRIX	2	4	-.2215E-02	-.2215E-02
B MATRIX	3	4	-.2853E-[illegible]	-.[illegible]
B MATRIX	3	5	-.[illegible]	-.[illegible]
B MATRIX	3	6	-.5810E-04	-.5806E-04
B MATRIX	3	7	-.1055E+02	-.1054E+02
B MATRIX	4	7	-.3246E+00	-.[illegible]
B MATRIX	6	7	-.1478E-01	-.1480E-01
B MATRIX	3	8	.[illegible]	.[illegible]
B MATRIX	4	8	-.[illegible]	-.[illegible]

0	AUXILIARY	MATRIX	1	1	-0.2137E-03	-0.2137E-03	
0	AUXILIARY	MATRIX	2	1	-0.6631E+03	-0.6378E+03	
0	AUXILIARY	MATRIX	3	1	-0.5707E+05	-0.5755E+05	
0	AUXILIARY	MATRIX	5	1	-0.3078E+05	-0.3095E+05	
0	AUXILIARY	MATRIX	7	1	-0.9702E+03	-0.9754E+03	
0	AUXILIARY	MATRIX	9	1	-0.2366E+04	-0.2336E+04	
0	AUXILIARY	MATRIX	11	1	-0.1304E+04	-0.1354E+04	
0	AUXILIARY	MATRIX	13	1	-0.1367E+04	-0.1364E+04	
0	AUXILIARY	MATRIX	10	1	-0.1057E+04	-0.1052E+04	
0	AUXILIARY	MATRIX	15	1	-0.9702E+03	-0.9754E+03	
0	AUXILIARY	MATRIX	21	1	-0.9266E+04	-0.9793E+03	
0	AUXILIARY	MATRIX	23	2	-0.1106E+04	-0.1064E+04	
0	AUXILIARY	MATRIX	1	2	-0.7547E+04	-0.7524E+04	
0	AUXILIARY	MATRIX	3	2	-0.1053E+03	-0.1154E+04	
0	AUXILIARY	MATRIX	5	2	-0.4911E+04	-0.4618E+04	
0	AUXILIARY	MATRIX	7	2	-0.9719E+03	-0.9451E+03	
0	AUXILIARY	MATRIX	9	2	-0.1105E+04	-0.1054E+04	
0	AUXILIARY	MATRIX	6	2	-0.5417E+03	-0.5405E+03	
0	AUXILIARY	MATRIX	10	2	-0.2977E+03	-0.2402E+03	
0	AUXILIARY	MATRIX	11	2	-0.1991E+03	-0.1541E+03	
0	AUXILIARY	MATRIX	12	2	-0.7529E+02	-0.7560E+02	
0	AUXILIARY	MATRIX	13	2			
0	AUXILIARY	MATRIX	14	2	-0.1422E+04	-0.1422E+04	
0	AUXILIARY	MATRIX	15	2	-0.1061E+03	-0.1064E+03	
0	AUXILIARY	MATRIX	16	2	-0.3424E+03	-0.3304E+03	
0	AUXILIARY	MATRIX	18	2	-0.1154E+03	-0.1157E+03	
0	AUXILIARY	MATRIX	20	2	-0.1249E+03	-0.1227E+03	
0	AUXILIARY	MATRIX	22	2	-0.3257E+03	-0.3241E+03	
0	AUXILIARY	MATRIX	23	2	-0.2462E+03	-0.2405E+03	
0	AUXILIARY	MATRIX	24	2	-0.1515E+03	-0.1516E+03	
0	AUXILIARY	MATRIX	4	3	-0.4747E+03	-0.4771E+03	
0	AUXILIARY	MATRIX	8	3	-0.6426E+04	-0.6424E+04	
0	AUXILIARY	MATRIX	5	3	-0.1960E+05	-0.2031E+05	
0	AUXILIARY	MATRIX	9	3	-0.4547E+03	-0.4556E+03	
0	AUXILIARY	MATRIX	10	3	-0.1675E+04	-0.1081E+04	
0	AUXILIARY	MATRIX	12	3	-0.3117E+03	-0.7196E+03	
0	AUXILIARY	MATRIX	13	3	-0.1602E+03	-0.1902E+03	
0	AUXILIARY	MATRIX	14	3	-0.3.69E+03	-0.3283E+03	
0	AUXILIARY	MATRIX	15	3	-0.9933E+03	-0.9372E+03	
0	AUXILIARY	MATRIX	16	3	-0.7166E+03	-0.7695E+03	
0	AUXILIARY	MATRIX	18	3	-0.1567E+03	-0.1671E+03	
0	AUXILIARY	MATRIX	20	3	-0.3312E+03	-0.3286E+03	
0	AUXILIARY	MATRIX	22	3	-0.7051E+03	-0.7457E+03	
0	AUXILIARY	MATRIX	24	3	-0.2967E+03	-0.2762E+03	
0	AUXILIARY	MATRIX	1	4	-0.1361E+04	-0.1360E+04	
0	AUXILIARY	MATRIX	3	4	-0.1554E+03	-0.1564E+03	
0	AUXILIARY	MATRIX	5	4	-0.9.11E+02	-0.9910E+02	
0	AUXILIARY	MATRIX	7	4	-0.2746E+01	-0.2420E+01	
0	AUXILIARY	MATRIX	9	4	-0.9139E+01	-0.9153E+01	
0	AUXILIARY	MATRIX	11	4	-0.4415E+01	-0.4411E+01	
0	AUXILIARY	MATRIX	13	4	-0.3963E+01	-0.3961E+01	
0	AUXILIARY	MATRIX	19	4	-0.2946E+01	-0.2923E+01	
0	AUXILIARY	MATRIX	21	4	-0.1585E+02	-0.1585E+02	

B AUXILIARY MATRIX	23	4	-.3712E+01	-.3712E+01
B AUXILIARY MATRIX	2	5	-.2132E+03	-.2100E+03
B AUXILIARY MATRIX	4	5	-.4311E+04	-.4218E+04
B AUXILIARY MATRIX	5	5	-.2350E+05	-.2324E+05
B AUXILIARY MATRIX	6	5	-.7232E+03	-.7147E+03
B AUXILIARY MATRIX	7	5	-.9557E+02	-.9460E+02
B AUXILIARY MATRIX	8	5	-.2144E+03	-.2115E+03
B AUXILIARY MATRIX	10	5	-.6362E+03	-.6265E+03
B AUXILIARY MATRIX	11	5	-.5145E+02	-.4959E+02
B AUXILIARY MATRIX	12	5	-.7654E+03	-.7564E+03
B AUXILIARY MATRIX	13	5	-.9574E+03	-.9463E+03
B AUXILIARY MATRIX	15	5	-.3351E+02	-.3262E+02
B AUXILIARY MATRIX	16	5	-.7601E+03	-.7572E+03
B AUXILIARY MATRIX	19	5	-.9557E+02	-.9480E+02
B AUXILIARY MATRIX	21	5	-.1061E+03	-.1050E+03
B AUXILIARY MATRIX	23	5	-.3304E+02	-.3141E+02
B AUXILIARY MATRIX	24	5	-.7232E+03	-.7147E+03
B AUXILIARY MATRIX	2	6	-.1932E+00	-.1932E+00
B AUXILIARY MATRIX	4	6	-.5508E+01	-.55[illegible]E+0[illegible]
B AUXILIARY MATRIX	5	6	-.2113E+02	-.2113E+02
B AUXILIARY MATRIX	6	6	-.1942E+00	-.1942E+00
B AUXILIARY MATRIX	13	6	-.8645E+00	-.8645E+00
B AUXILIARY MATRIX	1	7	-.1067E+04	-.1043E+04
B AUXILIARY MATRIX	2	7	-.3691E+04	-.3677E+04
B AUXILIARY MATRIX	3	7	-.3206E+04	-.3275E+04
B AUXILIARY MATRIX	4	7	-.8213E+04	-.8179E+04
B AUXILIARY MATRIX	5	7	-.1903E+04	-.1903E+04
B AUXILIARY MATRIX	8	7	-.3414E+04	-.3424E+04
B AUXILIARY MATRIX	9	7	-.5692E+05	-.5874E+05
B AUXILIARY MATRIX	10	7	-.8265E+04	-.8744E+04
B AUXILIARY MATRIX	11	7	-.2442E+05	-.2462E+05
B AUXILIARY MATRIX	13	7	-.1067E+04	-.1063E+04
B AUXILIARY MATRIX	14	7	-.4005E+04	-.3992E+04
B AUXILIARY MATRIX	15	7	-.5841E+04	-.5822E+04
B AUXILIARY MATRIX	16	7	-.9155E+04	-.9126E+04
B AUXILIARY MATRIX	17	7	-.2171E+04	-.2167E+04
B AUXILIARY MATRIX	19	7	-.1761E+04	-.1763E+04
B AUXILIARY MATRIX	20	7	-.4004E+04	-.3991E+04
B AUXILIARY MATRIX	22	7	-.9184E+04	-.9159E+04
B AUXILIARY MATRIX	23	7	-.5027E+03	-.4978E+03
B AUXILIARY MATRIX	24	7	-.1939E+03	-.1884E+03
B AUXILIARY MATRIX	1	6	-.7765E+02	-.7777E+02
B AUXILIARY MATRIX	2	6	-.1981E+03	-.198 E+03

* *

34 SOME OF THE INVALID STABILITY DERIVATIVES HAVE NOT BEEN FLAGGED BECAUSE THE ARRAY IS FULL.
SUBROUTINE MATIVE
LOCATN = 301

EIGENVALUES AND NORMALIZED EIGENVECTORS

EIGENVALUES	0.0000	0.0000	0.0000	-.1139	.4154	-.4139	-.4154	-.0331	.2721	-.0331
NORMALIZED EIGENVECTORS										
L0	0.0000	0.0000	0.0000	-.0272	-.0200	-.0272	.0200	.0852	.0247	.0852
L1	0.0000	0.0000	0.0000	-.1081	.5294	-.1081	-.5294	-.0014	-.0026	-.0014
L2	0.0000	0.0000	0.0000	.0319	.0039	.0319	-.0039	.0513	.1284	.0513
L3	0.0000	0.0000	0.0000	.0374	-.0354	.0374	.0354	.0000	.0001	.0000
L4	0.0000	0.0000	0.0000	-.0003	-.0006	-.0003	.0006	.0026	.0020	.0026
L5	0.0000	0.0000	0.0000	.0034	.0008	.0034	-.0008	.0000	.0001	.0000
L6	1.0000	0.0000	0.0000	-.0281	.0731	-.0281	-.0731	.0006	-.2469	.0006
L7	0.0000	0.0000	1.0000	1.0000	0.0000	1.0000	0.0000	-.0190	-.0038	-.0190
L8	0.0000	0.0000	0.0000	-.0752	.1591	-.0752	-.1591	1.0000	0.0000	1.0000
L9	0.0000	0.0000	0.0000	-.1023	.0620	-.1023	-.0620	.0004	-.0001	.0004
LPHI	0.0000	0.0000	0.0000	-.0012	.0011	-.0012	-.0011	.0006	-.0104	.0006
LTHETA	0.0000	0.0000	0.0000	-.0004	-.0001	-.0004	.0001	.0002	-.0002	.0002
LPSI	0.0000	0.0000	0.0000	-.0004	-.0001	-.0004	.0001	.0002	-.0002	.0002

EIGENVALUES	-.4237	0.0000	-.0078	.1237	-.0410	0.0000	-.1226	0.0000	-.0000	0.0000
NORMALIZED EIGENVECTORS										
L0	-.1429	0.0000	-.0102	.0022	-.0410	0.0000	-.1226	0.0000	-.0000	0.0000
L1	-.3674	0.0000	.0379	.0652	-.0003	0.0000	-.2765	0.0000	-.0000	0.0000
L2	-.8597	0.0000	.0116	.0204	.0004	0.0000	-.2079	0.0000	.0000	0.0000
L3	-.0002	0.0000	-.0003	.0004	.0000	0.0000	-.0017	0.0000	.0000	0.0000
L4	.0024	0.0000	.0001	.0001	-.0001	0.0000	.0000	0.0000	-.0000	0.0000
L5	-.0003	0.0000	-.0005	.0004	.0000	0.0000	-.0017	0.0000	.0000	0.0000
L6	.2560	0.0000	-.0830	.0830	.0000	0.0000	1.0000	0.0000	1.0000	0.0000
L7	-.0416	0.0000	0.0000	0.0000	.0009	0.0000	.6280	0.0000	.0307	0.0000
L8	1.0000	0.0000	-.0257	.0521	-.0004	0.0000	.8340	0.0000	.1491	0.0000
L9	.0010	0.0000	-.0031	-.0026	.0000	0.0000	.0140	0.0000	-.0000	0.0000
LPHI	-.0110	0.0000	.0004	.0010	.0000	0.0000	-.3075	0.0000	.0000	0.0000
LPSI	.0014	0.0000	-.0033	-.0042	.0000	0.0000	.0139	0.0000	-.0000	0.0000

MSL SUBROUTINE LAMP PREFORMANCE INDEX = 13.097

----------FLIGHT CONTROL SYSTEM CONFIGURATION----------

-----FLIGHT CONTROL SYSTEM LIMITS
PHILIM = .35000E+00 RADIANS
PHILIM = .46000E+00 RADIANS
THILIM = .46000E+00 RADIANS
THILIM = .45000E+00 RADIANS
PHITLM = .35000E+00 RADIANS
PHITLM = .46000E+00 RADIANS
PHITLM = .35000E+00 RADIANS
PHITLM = .46000E+00 RADIANS
THETLM = .35000E+00 RADIANS
THETLM = .46000E+00 RADIANS
AILP = .35000E+00 RADIANS
AILR = .46000E+00 RADIANS

-----FEEDBACK CONTROL FLAGS
UFDBK = T T = BODY AXIS U FEEDBACK AND F = BODY AXIS U APPARENT FEEDBACK
VFDBK = T T = BODY AXIS V FEEDBACK AND F = BODY AXIS V APPARENT FEEDBACK
RFDBK = T T = BODY AXIS YAW RATE FEEDBACK AND F= EULER AXIS PSIDOT FEEDBACK

-----CLOSED LOOP FLAGS FOR EACH LINEAR CONTROL
ULPFLG = T T = U LOOP CLOSED; F = U LOOP OPEN
VLPFLG = T T = V LOOP CLOSED; F = V LOOP OPEN
PSITLPF = T T = PSIDOT LOOP CLOSED; F = PSIDOT LOOP OPEN
PLPFLG = T T = P LOOP CLOSED; F = P LOOP OPEN
QLPFLG = T T = Q LOOP CLOSED; F = Q LOOP OPEN
THTLPF = T T = TURN RATE LOOP CLOSED; F = TURN RATE LOOP OPEN

-----FLIGHT CONTROL SYSTEM GAINS
AUSPED = .15900E+00 RAD / (FT / SEC)
AIU = .10000E-01 RAD / FT
IAXAC = 0. RAD / (FT / (SEC**2))
AVSPED = .35000E+00 RAD / (FT / SEC)
AIV = .10000E-01 RAD / FT
IAYAC = 0. RAD / (FT / (SEC**2))
AHDOT = .22220E-01 RAD / (FT / SEC)
AIHDOT = .53000E-01 RAD / FT
IAZAC = 0. RAD / (FT / (SEC**2))
APHI = .21800E+00 RAD / RAD
AIPHI = .14000E+00 RAD / (RAD * SEC)
IRULRT = .13330E+01 RAD / (RAD / SEC)
ATHETA = .47500E+00 RAD / RAD
AITHET = .10000E+00 RAD / (RAD * SEC)
IPTHAT = .24000E+01 RAD / (RAD / SEC)
ATRAT = .76000E+01 RAD / (RAD / SEC)
AIR = .10000E-01 RAD / RAD

-----TIMES AND CONTROL SYSTEM GAINS FOR HOVER CONTROL
FLSMI1 = 2000.0000 SECONDS STARTING TIME FOR HOVER
FLSMI2 = 2200.0000 SECONDS ENDING TIME FOR HOVER
AX = 1.0000 (FT / SEC) / FT X DIRECTION GAIN
AY = .2000 (FT / SEC) / FT Y DIRECTION GAIN
AH = 1.0000 (FT / SEC) / FT H DIRECTION GAIN
APSI = 1.0000 (RAD / SEC) / RAD YAW ANGLE GAIN

-----FEEDBACK SENSOR LOCATIONS
RACCG = 0. 0. .0038E+02 FEET
RVSACG = 0. 0. 0. FEET

```
----------TIME HISTORY PROFILE----------

  * * * * *  TEST COMMANDS  * * * * *

-----COMMAND TIME FOR ACTION                    COMMAND START
ATIME1 =  20.000000 SECONDS                     COMMAND END
ATIME2 =  22.000000 SECONDS

-----COMMANDED ACTUATOR COLLECTIVE DEFLECTION INCREMENT FOR:
CINCR1 =    .0000 RADIANS                       LPU-1
CINCR2 =    .0000 RADIANS                       LPU-2
CINCR3 =    .0000 RADIANS                       LPU-3
CINCR4 =    .0000 RADIANS                       LPU-4

-----COMMANDED ACTUATOR LATERAL DEFLECTION INCREMENT ONS
LATINC1 =   0.0000 RADIANS                      LPU-1
LATINC2 =   0.0000 RADIANS                      LPU-2
LATINC3 =   0.0000 RADIANS                      LPU-3
LATINC4 =   0.0000 RADIANS                      LPU-4

-----COMMANDED ACTUATOR LONGITUDINAL DEFLECTION  INCREMENT ONS
LONINC1 =   0.0000 RADIANS                      LPU-1
LONINC2 =   0.0000 RADIANS                      LPU-2
LONINC3 =   0.0000 RADIANS                      LPU-3
LONINC4 =   0.0000 RADIANS                      LPU-4

-----COMMAND TIME FOR PROPELLER                 COMMAND START
PTIME1 =  20.000000 SECONDS                     COMMAND END
PTIME2 =  22.000000 SECONDS

-----COMMANDED PROPELLER COLLECTIVE DEFLECTION INCREMENT FOR:
CINCP1 =    .0000 RADIANS                       LPU-1
CINCP2 =    .0000 RADIANS                       LPU-2
CINCP3 =    .0000 RADIANS                       LPU-3
CINCP4 =    .0000 RADIANS                       LPU-4

-----COMMAND TIME FOR LINKED CONTROL SYSTEM     COMMAND START
LATIME1 =  20.000000 SECONDS                    COMMAND END
LATIME2 =  22.000000 SECONDS

-----COMMANDED LINKED CONTROL INCREMENTS FOR:
LATINC =    0.0000 RADIANS                      X DIRECTION
LONINC =    0.0000 RADIANS                      Y DIRECTION
YAWINC =    0.0000 RADIANS                      Z DIRECTION
RCOLL =     0.0000 RADIANS                      COLL
PCYCL =     0.0000 RADIANS                      PITCH
YAW =       0.0000 RADIANS                      YAW

-----COMMAND TIMES AND CORRESPONDING DEFLECTIONS OF THE TAIL
TTIME1 =  22.000000 SECONDS                     STARTING TIME
TTIME2 =  22.400000 SECONDS                     ENDING TIME
TAILAT =    0.      RADIANS                     AILERON DEFLECTION
TAILEL =    0.      RADIANS                     ELEVATOR DEFLECTION
TAILRD =    0.      RADIANS                     RUDDER DEFLECTION
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      * * * * * * FLIGHT CONTROL SYSTEM COMMANDS * * * * * *

      TIME                COMMAND              X - VELOCITY  FT./SEC.      (UCMD)
      .1000E+01           .1000E+02

      TIME                COMMAND              Y - VELOCITY  FT./SEC.      (VCMD)
      .2000E+01           0.
      .4000E+01           .1000E+01

      TIME                COMMAND              H - VELOCITY  FT./SEC.      (HDTCMD)
      .1000E+01           .1000E+01

      TIME                COMMAND              ROLL ANGLE    RADIANS       (PHICMD)
      .1000E+01           0.
      .4000E+01           .1000E+00

      TIME                COMMAND              PITCH ANGLE   RADIANS       (THECMD)
      .1000E+01           .1000E+00

      TIME                COMMAND              YAW RATE      RAD./SEC.     (PTCMD)
      .1000E+01           0.
      .4000E+01           .1000E+01
```

----------GUST INPUTS----------

-----HULL GUST COMMANDS WITH RESPECT TO THE HULL CENTER OF VOLUME. GENERATED BY (1 - COSINE)

HTiGST =	2000.0000 SECONDS	START TIME FOR THE HULL GUST INTERVAL
HTeGST =	2200.0000 SECONDS	END TIME FOR THE HULL GUST INTERVAL
uHGMAX =	0.0000 FT./SEC.	MAXIMUM LINEAR GUST VELOCITY X-DIRECTION
vHGMAX =	0.0000 FT./SEC.	MAXIMUM LINEAR GUST VELOCITY Y-DIRECTION
wHGMAX =	0.0000 FT./SEC.	MAXIMUM LINEAR GUST VELOCITY Z-DIRECTION
PHGMAX =	0.0000 RAD./SEC.	MAXIMUM ROLLING GUST VELOCITY ABOUT THE X-AXIS
QHGMAX =	0.0000 RAD./SEC.	MAXIMUM PITCHING GUST VELOCITY ABOUT THE Y-AXIS
RHGMAX =	0.0000 RAD./SEC.	MAXIMUM YAWING GUST VELOCITY ABOUT THE Z-AXIS
DUXHMX =	0.0000 FT./(SEC.**2)	MAXIMUM VALUE OF THE HULL X-DIRECTION VELOCITY DERIVATIVE ALONG THE HULL X-AXIS
DUYHMX =	0.0000 FT./(SEC.**2)	MAXIMUM VALUE OF THE HULL X-DIRECTION VELOCITY DERIVATIVE ALONG THE HULL Y-AXIS
DVYHMX =	0.0000 FT./(SEC.**2)	MAXIMUM VALUE OF THE HULL Y-DIRECTION VELOCITY DERIVATIVE ALONG THE HULL Y-AXIS

-----TAIL GUST COMMANDS WITH RESPECT TO THE TAIL CENTROID. GENERATED BY (1 - COSINE)

TTiGST =	2000.0000 SECONDS	STARTING TIME FOR THE TAIL GUST INTERVAL
TTeGST =	2200.0000 SECONDS	ENDING TIME FOR THE TAIL GUST INTERVAL
uTGMAX =	0.0000 FT./SEC.	MAXIMUM LINEAR GUST VELOCITY X-DIRECTION
vTGMAX =	0.0000 FT./SEC.	MAXIMUM LINEAR GUST VELOCITY Y-DIRECTION
wTGMAX =	0.0000 FT./SEC.	MAXIMUM LINEAR GUST VELOCITY Z-DIRECTION
PTGMAX =	0.0000 RAD./SEC.	MAXIMUM GUST ANGULAR ROLLING VELOCITY ABOUT THE X-AXIS
QTGMAX =	0.0000 RAD./SEC.	MAXIMUM GUST ANGULAR PITCHING VELOCITY ABOUT THE Y-AXIS
RTGMAX =	0.0000 RAD./SEC.	MAXIMUM GUST ANGULAR YAWING VELOCITY ABOUT THE Z-AXIS
DUXTMX =	0.0000 FT./(SEC.**2)	MAXIMUM VALUE OF THE TAIL X-DIRECTION VELOCITY DERIVATIVE ALONG THE TAIL X-AXIS
DUYTMX =	0.0000 FT./(SEC.**2)	MAXIMUM VALUE OF THE TAIL X-DIRECTION VELOCITY DERIVATIVE ALONG THE TAIL Y-AXIS
DVYTMX =	0.0000 FT./(SEC.**2)	MAXIMUM VALUE OF THE TAIL Y-DIRECTION VELOCITY DERIVATIVE ALONG THE TAIL Y-AXIS

-----TIMES AND MAXIMUM VELOCITIES FOR A GUST ACTING AT THE CENTER OF GRAVITY ON LPU-1.
GENERATED BY (1 - COSINE)

L1TiGT =	2000.0000 SECONDS	STARTING TIME
L1TeGT =	2200.0000 SECONDS	ENDING TIME
uL1GMX =	0.0000 FT./SEC.	LINEAR GUST VELOCITY X-DIRECTION
vL1GMX =	0.0000 FT./SEC.	LINEAR GUST VELOCITY Y-DIRECTION
wL1GMX =	0.0000 FT./SEC.	LINEAR GUST VELOCITY Z-DIRECTION

-----TIMES AND MAXIMUM VELOCITIES FOR A GUST ACTING AT THE CENTER OF GRAVITY ON LPU-2.
GENERATED BY (1 - COSINE)

L2TiGT =	2000.0000 SECONDS	STARTING TIME
L2TeGT =	2200.0000 SECONDS	ENDING TIME
uL2GMX =	0.0000 FT./SEC.	LINEAR GUST VELOCITY X-DIRECTION
vL2GMX =	0.0000 FT./SEC.	LINEAR GUST VELOCITY Y-DIRECTION
wL2GMX =	0.0000 FT./SEC.	LINEAR GUST VELOCITY Z-DIRECTION

-----TIMES AND MAXIMUM VELOCITIES FOR A GUST ACTING AT THE CENTER OF GRAVITY ON LPU-3.
GENERATED BY (1 - COSINE)

L3TiGT =	2000.0000 SECONDS	STARTING TIME
L3TeGT =	2200.0000 SECONDS	ENDING TIME
uL3GMX =	0.0000 FT./SEC.	LINEAR GUST VELOCITY X-DIRECTION
vL3GMX =	0.0000 FT./SEC.	LINEAR GUST VELOCITY Y-DIRECTION
wL3GMX =	0.0000 FT./SEC.	LINEAR GUST VELOCITY Z-DIRECTION

-----TIMES AND MAXIMUM VELOCITIES FOR A GUST ACTING AT THE CENTER OF GRAVITY ON LPU-4.
GENERATED BY (1 - COSINE)

L4TiGT =	2000.0000 SECONDS	STARTING TIME
L4TeGT =	2200.0000 SECONDS	ENDING TIME
uL4GMX =	0.0000 FT./SEC.	LINEAR GUST VELOCITY X-DIRECTION
vL4GMX =	0.0000 FT./SEC.	LINEAR GUST VELOCITY Y-DIRECTION
wL4GMX =	0.0000 FT./SEC.	LINEAR GUST VELOCITY Z-DIRECTION

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-----GUST STRING PARAMETERS
GSTFLG = F                T = GUST STRING WANTED;  F = GUST STRING NOT WANTED
GSTSCF =    1.0000        GUST STRING SCALE FACTOR

-----POSITIONS OF THE FOUR GUST SOURCES
AFSRCX =  100.0000 FEET   X DISTANCE TO FORWARD SOURCES
RASRCX = -100.0000 FEET   X DISTANCE TO AFT SOURCES
RSSRCY =  100.0000 FEET   Y DISTANCE BOTH LEFT AND RIGHT
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----------COMPUTER ALGORITHM TIME STEPS INPUT----------

                                NUMERICAL INTEGRATION TAPE STEP
                                MINIMUM NUMERICAL TIME STEP ALLOWED
                                OUTPUT PRINT INTERVAL
                                TOTAL SIX DEGREE OF FREEDOM SIMULATION TIME

TIMSTP =  .0050000 SECONDS
MINSTP =  .0050000 SECONDS
TPRINT =  .1000000 SECONDS
TSIM   =  .0000000 SECONDS
```

SIMULATION TIME -- 0.00

	U	V	W	P	Q	R	X	Y	Z	PHI
NULL	14.000	0.	0.	0.	0.	0.	0.	0.	-1000.	0.
	THETA	PSI	AXCGG	AYCGG	AZCGG	NORMT	NDTMT	VFGUST:X	VFGUST:Y	VFGUST:Z
NULL	0.	0.	-.276806-11	-.569736-13	-.178326-13	9.3702	9.2421	0.	0.	0.
	OMGUST:X	OMGUST:Y	OMGUST:Z	DUGDXH	DUGDYH	DVGDYH	VDRMGT:X	VDRMGT:Y	VDRMGT:Z	OMGST.
NULL	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
	UDMGST:Y	UDMGST:Z	VDMGST:X	VDMGST:Y	VDMGST:Z	GGRDAC:X	GGRDAC:Y	GGRDAC:Z	RGDMAC:X	RGDMAC:Y
NULL	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
	MGDMAC:Z	VTGUST:X	VTGUST:Y	VTGUST:Z	OTGUST:X	OTGUST:Y	OTGUST:Z	DUGDXT	DUGDYT	DVGDYT
NULL	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
	VDRTGT:X	VDRTGT:Y	VDRTGT:Z	GDTGST:X	GDTGST:Y	GDTGST:Z	VDTGST:X	VDTGST:Y	VDTGST:Z	MGTRAC:X
NULL	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
	MGDTAC:Y	MGDTAC:Z	RVMLCV:X	RVMLCV:Y	RVMLCV:Z	ROMLCV:X	ROMLCV:Y	ROMLCV:Z	GAMAH	DAMDAH
NULL	0.	0.	44.133	.381206-01	-.65422	0.	0.	0.	0.	3.0[illegible]59
	ZETAH	DAMDPH	RVTAIL:X	RVTAIL:Y	RVTAIL:Z	RCTAIL:X	RCTAIL:Y	RCTAIL:Z	ALT	PALT
NULL	-3.0859	1.0706	43.539	.747026-03	-.16723	0.	0.	0.	-.3[illegible]196E-02	-.32196 -
	BETAT	PDETAT	ALPTO	ALPT	PALPT	PALPTO	RHIVEL:X	RHIVEL:Y	RHIVEL:Z	RHIVEL:[illegible]
NULL	-.116586-02	-.116586-02	0.	.161576-02	.161576-02	0.	-.13382	.266196-02	.65260	.3[illegible]254.-
	PHIVEL:Y	PHIVEL:Z	RTIVEL:X	RTIVEL:Y	RTIVEL:Z	PTIVEL:X	PTIVEL:Y	PTIVEL:Z	RCFLWD	PCFLWD
NULL	-.497826-01	.3[illegible]23E-01	.44055	.591566-03	.15973	.207236-01	-.12986E-02	.74947E-02	.87239E-01	.4[illegible]12 --
	C FLOW C	T.AC	TCLC	ZAVSOT	RHBFOR:X	RHBFOR:Y	RHBFOR:Z	STATBF:X	STATBF:Y	STATBF:Z
NULL	-30.617	1.0001	1.0000	-4.1410	0.	0.	-.11476[illegible]+06	C.	C.	-.1147[illegible]
	GAMBFO:X	GAMBFO:Y	GAMBFO:Z	GGHBFO:X	GGHBFO:Y	GGHBFO:Z	RHOWFO:X	RHOWFO:Y	RHOWFO:Z	RHOWFO:X
NULL	0.	0.	0.	0.	0.	0.	-805.60	-.79982	13.148	0.
	RHOWMO:Y	RHOWMO:Z	HGAAMF:X	HGAAMF:Y	HGAAMF:Z	HGAAMM:X	HGAAMM:Y	HGAAMM:Z	HGGAMF:X	HGGAMF:Y
NULL	-43661.	-2443.6	0.	0.	0.	0.	0.	0.	0.	0.
	HGGAMF:Z	HGGAMM:X	HGGAMM:Y	HGGAMM:Z	RHOGFO:X	RHOGFO:Y	RHOGFO:Z	RHOGMO:X	RHOGMO:Y	RHOGMO:Z
NULL	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
	GHCIFO:X	GHCIFO:Y	GHCIFO:Z	GHCIMO:X	GHCIMO:Y	GHCIMO:Z	HCACFO:X	HCACFO:Y	HCACFO:Z	HCACMO:X
NULL	0.	.118396-16	0.	0.	0.	0.	.529036-07	-.82006E-07	.14917[illegible]-06	0.
	HCACMO:Y	HCACMO:Z	RHOAF :X	RHOAF :Y	RHOAF :Z	RHOAMO:X	RHOAMO:Y	RHOAMO:Z	HCAIF :X	HCAIF :Y
NULL	.202126-05	-.20926E-05	-805.60	-.79982	13.148	0.	-43361.	-2443.6	-80[illegible].60	-.79[illegible]
	HOAIF :Z	HOAIMO:X	HOAIMO:Y	HCA MO:Z	HOTAFO:X	HOTAFO:Y	HOTAFO:Z	HOTAMO:X	HOTAMO:Y	HOTAMO:Z
NULL	-.11475E+06	-13.301	-30464.	-2443.6	-805.60	-.79982	-.11475[illegible]+06	-13.301	-30464.	-2443.6
	TAFOR	TSYFOR	TOYFOR	TSZFOR	TSLMOM	TOLMOM	RTOWFO:X	RTOWFO:Y	RTOWFO:Z	RTOWMO:X
NULL	-261.41	6.0063	0.	25.281	6.7999	-237.83	-261.41	6.0063	25.281	-231.[illegible]
	RTOWMO:Y	RTOWMO:Z	TGAAMF:X	TGAAMF:Y	TGAAMF:Z	TGAAMM:X	TGAAMM:Y	TGAAMM:Z	TGGAMF:X	TGGAMF:Y
NULL	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
	TGGAMF:Z	TGGAMM:X	TGGAMM:Y	TGGAMM:Z	RTOGFO:X	RTOGFO:Y	RTOGFO:Z	RTOGMO:X	RTOGMO:Y	RTOGMO:Z
NULL	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.

CPU VARIABLES AT TIME = 0.00

	U	V	W	PHID	THETD	PSID	X	Y	Z	PHI
CPU1	13.991	0.	.46990	0.	0.	0.	37.895	-81.500	-960.63	0.
CPU2	13.991	0.	-.46990	0.	0.	0.	38.105	81.500	-960.63	0.
CPU3	13.991	0.	.46990	0.	0.	0.	-38.105	-81.500	-960.63	0.
CPU4	13.991	0.	-.46990	0.	0.	0.	-37.895	81.500	-960.63	0.

	THETA	PSI	NORMT	NORMT	GEAR :X	GEAR :Y	GEAR :Z	IVSOR :X	IVSOR :Y	IVSOR :Z
CPU1	.35000E-01	0.	17.279	73.368	36.000	-46.000	-951.31	I	I	
CPU2	-.35000E-01	0.	17.279	73.293	36.000	46.000	-951.31	I	I	
CPU3	.35000E-01	0.	17.279	73.368	-36.000	-46.000	-951.31	I	I	
CPU4	-.35000E-01	0.	17.279	73.293	-36.000	46.000	-951.31	I	I	

	VSORC :X	VSORC :Y	VSORC :Z	VGUST :X	VGUST :Y	VGUST :Z	RVLPU :X	RVLPU :Y	RVLPU :Z	RVPOS :X
CPU1	I	I	I	0.	0.	0.	43.973	0.	1.5397	52.177
CPU2	I	I	I	0.	0.	0.	43.973	0.	-1.5397	50.177
CPU3	I	I	I	0.	0.	0.	43.973	0.	1.5397	52.377
CPU4	I	I	I	0.	0.	0.	43.973	0.	-1.5397	50.165

	RVPOS :Y	RVPOS :Z	RVROT :X	RVROT :Y	RVROT :Z	RVPRP :X	RVPRP :Y	RVPRP :Z	RPIV :X	RPIV :Y
CPU1	-.40207E-01	-5.7135	43.973	0.	1.5397	44.384	-.40207E-01	-5.9946	-.41140	.40207E-
CPU2	-.40482E-01	-9.3332	43.973	0.	-1.5397	44.314	-.40482E-01	-9.1291	-.39119	.40482 -01
CPU3	-.43070E-01	-8.2506	43.973	0.	1.5397	44.414	-.43070E-01	-8.5311	-.44070	.43070E-01
CPU4	-.43323E-01	-9.0040	43.973	0.	-1.5397	44.336	-.43323E-01	-9.6617	-.39514	.43323 -01

	RPIV :Z	RFIV :X	RFIV :Y	RFIV :Z	PFIV :X	PFIV :Y	PFIV :Z	LCS F	DELTA P	GEAR
CPU1	7.5342	-.41140	.40207E-01	7.5342	-7.9776	0.	-.28097	3.6936	.84114E-02	1.0000
CPU2	7.5894	-.39119	.40482E-01	7.5894	-5.0632	0.	.20410	3.6974	.84138E-02	1.0000
CPU3	8.0703	-.44070	.43070E-01	8.0703	-7.9636	0.	-.28046	3.7113	.84173E-02	1.0000
CPU4	8.1221	-.39514	.43323E-01	8.1221	-5.0272	0.	.20285	3.7150	.84284E-02	1.0000

	LCSPE	DELTA P	GEARP	STHER	SAISR	SBISR	SCMGR	PTHIR	PAISR	PBISR
CPU1	3.7257	.84500E-02	1.0000	.38318E-01	-.53286E-02	.54550E-01	23.250	0.	0.	0.
CPU2	3.6981	.84900E-02	1.0000	.44781E-01	-.53286E-02	.44926E-01	23.250	0.	0.	0.
CPU3	3.7257	.84500E-02	1.0000	.40804E-01	-.53286E-02	.54550E-01	23.250	0.	0.	0.
CPU4	3.6973	.84504E-02	1.0000	.47267E-01	-.53286E-02	.44926E-01	23.250	0.	0.	0.

	THEOR	AISR	BISR	OMEGR	STHEP	SCMGP	PTHIP	THEOP	OMEGP	TR
CPU1	.38316E-01	-.53286E-02	.54550E-01	23.250	.10188	125.66	0.	.10188	125.66	2449.7
CPU2	.44781E-01	-.53286E-02	.44926E-01	23.250	.97070E-01	125.66	0.	.97070E-01	125.66	2442.4
CPU3	.40804E-01	-.53286E-02	.54550E-01	23.250	.10188	125.66	0.	.10188	125.66	2447.7
CPU4	.47267E-01	-.53286E-02	.44926E-01	23.250	.97070E-01	125.66	0.	.97070E-01	125.66	2440.4

	QK	ROTFO :X	ROTFO :Y	ROTFO :Z	ROTMO :X	ROTMO :Y	ROTMO :Z	TP	GP	PROPF :X
CPU1	5134.0	97.071	-1.0277	-2448.0	-292.75	-657.74	5127.0	158.99	200.43	156.84
CPU2	5430.0	74.106	-1.4830	-2481.0	-254.24	-484.82	5424.4	114.75	187.70	114.83
CPU3	5214.0	100.54	-1.1547	-2624.9	-242.40	-711.02	5206.8	158.98	200.42	156.83
CPU4	5552.0	74.993	-.77402	-2659.5	-253.89	-530.47	5527.0	114.39	187.53	114.17

	PROPF :Y	PROPF :Z	PROPM :X	PROPM :Y	PROPM :Z	FUSFO :X	FUSFO :Y	FUSFO :Z	FUSFO :X	FUSFO :Y
CPU1	.76904E-02	7.0772	-200.30	-99.051	-7.1550	-80.320	.32494E-03	21.089	0.	0.
CPU2	.74519E-02	-2.0007	-187.59	36.410	6.0343	-55.391	.30943E-03	56.277	0.	0.
CPU3	.84923E-02	7.0823	-200.29	-100.55	-7.1467	-80.359	.37287E-03	25.247	0.	0.
CPU4	.79760E-02	-2.0861	-187.42	34.415	6.0358	-55.364	.37726E-03	62.862	0.	0.

	FUSAO :X	JETMS	JETFO :X	JETFO :Y	JETFO :Z	JETMO :X	JETMO :Y	JETMO :Z	LPAMO :X	LPAMO :Y
CPU1	0.	100.00	98.545	0.	-16.997	0.	-465.60	0.	294.99	-1.5195
CPU2	0.	100.00	98.545	0.	-16.997	0.	-465.60	0.	232.09	-1.4753
CPU3	0.	100.00	98.545	0.	-16.997	0.	-465.60	0.	302.59	-1.1486
CPU4	0.	100.00	98.545	0.	-16.997	0.	-465.60	0.	237.53	-.76586

	LPAMO :Z	LPAMO :X	LPAMO :Y	LPAMO :Z	MCGLF :X	MCBLF :Y	MCBLF :Z	MCBLM :X	MCB M :Y	MCBLM :Z
LPU1	-2436.6	-444.05	-1222.4	5119.9	0.	0.	0.	C.	C.	C.
LPU2	-2444.9	-441.83	-914.02	5431.1	0.	0.	C.	C.	C.	C.
LPU3	-2009.5	-496.8.	-1277.2	5199.7	0.	0.	0.	C.	C.	C.
LPU4	-2516.1	-441.31	-961.26	5513.6	0.	C.	0.	C.	C.	C.

	GCPAS	GCFOR :X	GCFOR :Y	GCFOR :Z	FRTMG	GFFOR :X	GFFOR :Y	GFFOR :Z	GFFMG :X	GFFMG :Y
LPU1	0.	0.	0.	0.	0.	0.	C.	0.	C.	C.
LPU2	0.	0.	0.	0.	C.	C.	0.	C.	C.	C.
LPU3	0.	0.	0.	0.	C.	0.	0.	C.	C.	C.
LPU4	0.	0.	0.	0.	0.	0.	0.	0.	C.	C.

	GEMFO :Z	MGMMO :X	MGMMO :Y	MGMMO :Z	CF :X	CF :Y	CF :Z	CM :X	CM :Y	CM :Z
LPU1	0.	0.	0.	0.	209.46	-1.8193	6547.0	-325.04	-1153.2	5134.7
LPU2	0.	0.	0.	0.	317.51	-1.4753	6557.3	-636.03	-2559.3	5412.1
LPU3	0.	0.	0.	0.	211.06	-1.1460	6374.2	-319.86	-1240.3	5214.1
LPU4	0.	0.	0.	0.	325.95	-.7b56C	6396.4	-6[illegible].97	-2617.9	551[illegible]

	AOA	AOA	BOA	CLAVR	ALA/R	VTR	TWINR	RCTIV :X	RCTIV :Y	RCTIV :Z
LPU1	.56761E-01	.57605E-02	.49840E-02	.95049E-01	.25732E-01	14.461	4.7160	-.25712	.25[illegible]29E-01	4.7389
LPU2	.52620E-01	.53490E-02	.47370E-02	.96319E-01	.25051E-01	14.557	4.7482	-.21325	.25[illegible]01E-01	4.7[illegible]
LPU3	.54154E-01	.51390E-02	.48905E-02	.10192	.27462E-01	14.975	5.0518	-.27544	.25[illegible]19E-01	5.0[illegible]
LPU4	.50023E-01	.47284E-02	.50440E-02	.10322	.27786E-01	15.070	5.0815	-.22821	.27077E-01	5.0703

	DSKLR	PDMLR R	CLAVP	ALA/P	VTP	TWINP	PRPIV :X	PRPIV :Y	PRPIV :Z	DSKLP
LPU1	.99459	227.06	.46008E-01	.12349E-01	15.749	4.9892	-4.9862	C.	-.17560	1.1796
LPU2	1.0079	229.54	.33235E-01	.91103E-02	13.385	3.6667	-3.6645	C.	.12756	.85212
LPU3	1.0065	229.49	.46005E-01	.12348E-01	15.748	4.9803	-4.9772	C.	-.17529	1.1795
LPU4	1.0001	230.86	.33102E-01	.90757E-02	13.359	3.6442	-3.6420	C.	.12678	.84771

	PDMLR P	LGLIT	GRAT
LPU1	47.163	3.3200	0.
LPU2	42.863	3.3200	0.
LPU3	47.160	3.3200	0.
LPU4	42.846	3.3200	0.

TAIL AERODYNAMIC REGIMES ANGLE OF ATTACK - 1 ANGLE OF SLIDESLIP - 1 ROLLING ANGLE OF ATTACK - 1

SIMULATION TIME -- 2.00

	U	V	W	P	Q	R	X	Y	Z
NULL	17.390	.234794E-02	-1.5973	-.486969E-03	.226156-01	-.54393E-03	15.511	-.12406E-02	-1000.5

	THETA	PSI	AXCGG	AYCGG	AZCGG	NORMT	NORMT	VHGUST:X	VHGUST:Y	VHGUST:Z
NULL	.600716-04	-.300716-03	.12332	.249954E-03	-.956836-01	9.8750	9.2386	0.	0.	0.

	UHGUST:X	UHGUST:Y	UHGUST:Z	DUGDXH	DUGDYH	DVGDYH	VDRHGT:X	VDRHGT:Y	VDRHGT:Z	DDHGST:
NULL	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.

	DDHGST:Y	DDHGST:Z	VDHGST:X	VDHGST:Y	VDHGST:Z	GGRDAC:X	GGRDAC:Y	GGRDAC:Z	PGD AC:X	PGDHA:Y
NULL	0.	0.	.663374E-02	-.161695-01	-.67845	0.	0.	0.	0.	0.

	MGUMAC:Z	VTGUST:X	VTGUST:Y	VTGUST:Z	OTGUST:X	OTGUST:Y	OTGUST:Z	DUGDXI	DUGDYI	DVGDYI
NULL	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.

	VDRTGT:X	VDRTGT:Y	VDRTGT:Z	ODTGST:X	ODTGST:Y	ODTGST:Z	VDTGST:X	VDTGST:Y	VDTGST:Z	PGDTA:X
NULL	0.	0.	0.	0.	0.	0.	.663374E-02	-.161695-01	-.67845	0.

	MGUTAC:Y	MGUTAC:Z	RVHLCV:X	RVHLCV:Y	RVHLCV:Z	RCHLCV:X	RCHLCV:Y	RCHLCV:Z	GAMAM	LAMDAM
NULL	0.	0.	43.575	.53647	-3.1350	-.486969E-03	.226156-01	-.54393E-03	1.5943	2.9714

	ZETAM	CAMDPH	RVTAIL:X	RVTAIL:Y	RVTAIL:Z	RCTAIL:X	RCTAIL:Y	RCTAIL:Z	ALT	PALT
NULL	-1.5773	1.5708	43.716	.553416E-01	.41364	-.486969E-03	.22615E-01	-.54393E-03	.109156-02	.109156-

	BETAT	PSIETAT	ALPTO	ALPT	PALPT	PALPTA	RHIVEL:X	RHIVEL:Y	RHIVEL:Z	PHIVEL:
NULL	-.192716-02	-.192716-02	-.586916-03	.962146-03	.962146-03	-.586916-03	1.4570	.33478E-02	1.0262	-.194816-

	PHIVEL:Y	PHIVEL:Z	RTIVEL:X	RTIVEL:Y	RTIVEL:Z	PTIVEL:X	PTIVEL:Y	PTIVEL:Z	RC LMC	PCPLMC
NULL	-.33334	.49337	1.0244	.814266-03	.37163	.27198	-.21611E-02	.98365E-01	.29596	.13476

	C FLUK C	IXAC	IYLC	ZAVSGT	RH FOR:X	RHBFOR:Y	RHBFOR:Z	STATBF:X	STATBF:Y	STATBF:Z
NULL	-38.999	1.0001	1.0000	-4.1410	1155.7	28.411	-.1147bE+06	1155.7	28.411	-.1147b +0n

	GAMBFO:X	GAMBFO:Y	GAMBFO:Z	GGHBFO:X	GGHBFO:Y	GGHBFO:Z	RHOWFO:X	RHOWFO:Y	RHOWFO:Z	RHOWMO:
NULL	0.	0.	0.	0.	0.	0.	-675.50	-46.106	964.02	.315126-0

	RHOWMO:Y	RHOWMO:Z	HGAAMF:X	HGAAMF:Y	HGAAMF:Z	HGAAMM:X	HGAAMM:Y	HGAAMM:Z	HGGAMF:X	HGGAMF:Y
NULL	-.225976+06	-35029.	4.9358	-42.040	-1763.9	0.	0.	0.	C.	0.

	HGGAMF:Z	HGGAMM:X	HGGAMM:Y	HGGAMM:Z	RHOGFO:X	RHO FO:Y	RHOGFO:Z	RHOGMO:X	RHOGMO:Y	RHOGMO:
NULL	0.	0.	C.	0.	4.9358	-42.040	-1763.9	0.	C.	0.

	GHCIFO:X	GHCIFO:Y	GHCIFO:Z	GHCIMO:X	GHCIMO:Y	GHCIMO:Z	HCACFO:X	HCACFO:Y	HCACFO:Z	HCACMO:
NULL	0.	.259186-16	.722656-20	0.	0.	0.	-2370.9	-36.784	70 .86	0.

	HCACMO:Y	HCACMO:Z	RHOAF :X	RHOAF :Y	RHOAF :Z	RHOAMO:X	RHOAMO:Y	RHOAMO:Z	HCAAF :X	HCAAF :Y
NULL	-92327.	736.75	-670.97	-88.147	-799.90	.315126-02	-.225976+06	-35029.	484.77	-59.73

	HCAAF :Z	HCAAMO:X	HCAAMO:Y	HCAAMO:Z	HCTAFO:X	HCTAFO:Y	HCTAFO:Z	HCTAMO:X	HCTAMO:Y	HCTAMO:Z
NULL	-.115506+06	-993.41	-.234036+06	-35029.	-1836.1	-96.520	-.108516+06	-99 .41	-.376351+06	-34240.

	TXCGK	TXYCGK	TXZCGK	TSLFOK	TSLMOM	TCLMOM	RTOWFO:X	RTOWFO:Y	RTOWFO:Z	RT
NULL	-266.21	10.767	1.0004	-9.4484	12.210	-149.44	-280.21	12.575	-5.44 4	-137.

	RTOWMO:Y	RTOWMO:Z	TGAAMF:X	TGAAMF:Y	TGAAMF:Z	TGAAMM:X	TGAAMM:Y	TGAAMM:Z	TGGAMF:X	TGGAMF:
NULL	0.	0.	0.	-7.9132	-410.45	-153.25	0.	0.	C.	C.

	TGGAMF:Z	TGGAMM:X	TGGAMM:Y	TGGAMM:Z	RTOGFO:X	RTOGFO:Y	RTOGFO:Z	RTOGMO:X	RTOGMO:Y	RTOGMO:
NULL	0.	0.	0.	0.	0.	-7.9132	-410.45	-153.25	C.	C.

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OF POOR QUALITY

TCACFO:X NULL 0.	TCACFO:Y -13.912	TCALFO:Z 200.24	TCALMO:X -232.02	TCACMO:Y -99.513	TCACMO:Z .85010	RTOAF :X -288.21	RTOAF :Y 4.6622	RTOAF :Z -417.90	RTOAF :Z -29.0	RTOAF :Z -29.0
RTOAMO:Y NULL 0.	RTOAMO:Z 0.	TOAFOR:X -200.21	TOAFOR:Y 4.3622	TCAFOR:Z -417.90	TCAMOM:X -217.95	TOAMOM:Y -31700.	TCA CM:Z -77.841	TCA CM:Z -28.21	TCAFOM:Y -9.2241	TCAFOM:Y -9.2241
TOTAFO:Z NULL -133.63	TOTAMO:Y -527.21	TOTAMO:Z -99.513	TOTAMO:Z .85010	HABFOR:X 190.57	HABFOR:Y -55.074	HABFOR:Z -.11596E+06	HABFOR:Z -1211.4	HABMOM:Y -2.5731E+06	HABMOM:Y -25107.	HABMOM:Y -25107.
HBALFO:X NULL -2370.7	HBALFO:Y -20.696	HBALFO:Z 7334.8	HBACMO:X -1075.1	HBACMO:Y -27952.	HBACMO:Z 2006.9	HTOTAF:X -2174.3	HTOTAF:Y -105.77	HTOTAF:Z -.10646E+06	HTOTAF:Z -2266.0	HTOTAF:Z -2266.0
HTOTAM:Y NULL -.79366E+06	HTOTAM:Z -2210.0	HCBLFO:X 0.	HCBLFO:Y 0.	HCBLFO:Z 0.	HCBLMO:X 0.	HCBLMO:Y 0.	HCBLFO:Z 0.	HGEAFO:X 0.	HGEAFO:X 0.	HGEAFO:X 0.
HGEAFO:Z NULL 0.	HGEAMO:X 0.	HGEAMO:Y 0.	HGEAMO:Z 0.	MONLOD:X I	MONLOD:Y I	MONLOD:Z I	AGZLCG:X I	AGZLCG:Y I	AGZLCG:Z I	AGZLCG:Z I
ULOA NULL 30.000	VLOA 0.	AUTOU 5.0000	PHICOM 0.	THECOM 1.0000	TRATCM 0.	PHRFIX I	PHRFIY I	PHRFIZ I	PHRFIZ I	PHRFIP I
VHSCNSIX NULL 90.000	VHSCNSIY -.16883E-02	VHSCNSIZ -1.0952	XSPEED 17.330	YSPEED .54794E-02	ZSPEED 1.5724	AXACC 3.9677	AYACC .80295E-02	AZ CC -3.1042	PHIERR .24757E-03	PQLRAT -.48569
PTLRAT NULL .22015E-01	TURRAT -.59393E-03	IACELCIX I	IACELCIY I	IACELCIZ I	UERR 12.610	YERR -.54794E-02	HDTERR 3.4276	PHIERR .24757E-03	THERR .85929	TRERR .85929
TRATER NULL .59393E-03	IERRIX I	IERRIY I	IERRIZ I	PSIERR I	UINT .10784	VINT -.53302E-02	HDTINT .45152E-01	PHIINT -.32190E-02	PHIINT -.32190E-02	TRINT -.15668
TRTINT NULL .49470E-02	UCONTL .90000	VCONTL -.69740E-02	WCONTL -.14125	PCONTL -.30226E-02	CCONTL .12913E-01	RCONTL .62786E-02	SQLTAL .30226E-02	SQLTAL -.12913E-01	SQLTAL -.62786	SQLTAL -.62786
PQLTAL NULL 0.	PQLTRU 0.	PQLTRU 0.	DELTAL .30226E-02	DELTEL -.12913E-01	DELTRU -.62786E-02					

LPU VARIABLES AT TIME = 1.000

	U	V	W	PHID	THETD	PSID	X	Y	Z	R
LPU1	18.302	.41470E-02	-1.3749	0.	0.	0.	53.775	-81.503	-961.49	0.
LPU2	18.233	.40328E-02	-2.7388	0.	0.	0.	54.035	81.497	-961.53	0.
LPU3	18.292	.43468E-01	.41276	0.	0.	0.	-22.221	-81.460	-96[illegible].7	0.
LPU4	18.295	.40372E-01	-1.2214	0.	0.	0.	-21.961	81.520	-96[illegible].77	0.

	THETA	PSI	NORMT	NORMT	GERIL :X	GERIL :Y	GERIL :Z	IVSOR :X	IVSOR :Y	IVSOR :Z
LPU1	.35000E-01	0.	17.294	73.444	51.985	-46.000	-952.16	I	I	
LPU2	-.35000E-01	0.	17.295	73.373	52.013	46.000	-952.18	I	I	
LPU3	.35000E-01	0.	17.281	73.386	-20.011	-45.978	-951.44	I	I	
LPU4	-.35000E-01	0.	17.282	73.314	-19.983	46.022	-951.46	I	I	

	VSORC :X	VSORC :Y	VSORC :Z	VGUST :X	VGUST :Y	VGUST :Z	RVLPU :X	RVLPU :Y	RVLPU :Z	RVLPU :R
LPU1	I	I	I	0.	0.	0.	48.272	.13216E-01	-.22326	144.4[illegible]
LPU2	I	I	I	0.	0.	0.	48.224	.13172E-01	-3.6866	140.2[illegible]
LPU3	I	I	I	0.	0.	0.	48.212	.54625E-01	1.4944	144.5[illegible]
LPU4	I	I	I	0.	0.	0.	48.264	.54511E-01	-1.3689	140.7[illegible]

	RVPUS :Y	RVPUS :Z	RVPUT :X	RVPUT :Y	RVPUT :Z	RVPRP :X	RVPRP :Y	RVPRP :Z	RPIV :X	RPIV :Y
LPU1	-.14314	-16.927	48.114	.99940E-02	-.22326	53.004	-.15099	-22.464	-4.7317	.15842
LPU2	-.14350	-20.615	48.065	.96133E-02	-3.6866	52.410	-.15087	-26.075	-4.1863	.15667
LPU3	-.66977E-01	-11.440	48.033	.51332E-01	1.4944	51.709	-.68822E-01	-15.024	-3.4967	.11560
LPU4	-.61703E-01	-21.430	48.126	.50952E-01	-1.3689	51.389	-.69073E-01	-18.657	-3.1042	.11621

	RPIV :Z	RFIV :X	RFIV :Y	RFIV :Z	PFIV :X	PFIV :Y	PFIV :Z	LCSRE	DELTA P	G FR
LPU1	21.924	-4.7317	.15842	21.924	-91.460	0.	-3.2211	4.2698	.13350E-01	1.0000
LPU2	22.072	-4.1863	.15667	22.072	-87.794	0.	3.0561	4.2611	.10499E-01	1.0000
LPU3	16.202	-3.4967	.11560	16.202	-92.799	0.	-3.2682	4.0504	.91573E-02	1.0000
LPU4	16.372	-3.1042	.11621	16.372	-89.313	0.	3.1090	4.0602	.91530E-02	1.0000

	LCSPE	DELTA P	GFP	STHCK	SALSR	SBLSR	SCMGR	PTHER	PALSP	PBLSP
LPU1	5.7300	.13691E-01	1.0000	.13414	-.69740E-02	.21256	23.250	0.	0.	0.
LPU2	5.7300	.10550E-01	1.0000	.14018	-.69740E-02	.16744	23.250	0.	0.	0.
LPU3	5.7300	.91738E-02	1.0000	.10231	-.69740E-02	.21256	23.250	0.	0.	0.
LPU4	5.7300	.91625E-02	1.0000	.10035	-.69740E-02	.16744	23.250	0.	0.	0.

	THCOR	ALSR	BLSR	CMCSR	STHCP	SC GP	PTHCP	THCOP	CPCGP	TR
LPU1	.13414	-.69740E-02	.21256	23.250	.40628	125.66	0.	.40628	125.66	8692.2
LPU2	.14018	-.69740E-02	.16744	23.250	.39372	125.66	0.	.39372	125.66	8414.1
LPU3	.10231	-.69740E-02	.21256	23.250	.40628	125.66	0.	.40628	125.66	6166.6
LPU4	.10035	-.69740E-02	.16744	23.250	.39372	125.66	0.	.39372	125.66	6287.0

	QR	ROTFO :X	ROTFO :Y	ROTFO :Z	ROTMO :X	ROTMO :Y	ROTMO :Z	TP	CP	PROPP :X
LPU1	14408.	1090.8	64.254	-8539.5	-2589.7	-11385.	14084.	4108.3	4102.3	4103.9
LPU2	13926.	1441.9	66.103	-8702.5	-2416.9	-9965.6	15184.	3902.1	3870.3	3901.2
LPU3	9917.0	1190.9	22.625	-6071.7	-1933.7	-8266.8	9693.6	4109.9	4102.3	4102.0
LPU4	10059.	1051.4	23.956	-6260.0	-1818.5	-7265.3	10472.	3908.8	3871.0	3907.5

	PROPP :Y	PROPP :Z	PROPM :X	PROPM :Y	PROPM :Z	FUSFO :X	FUSFO :Y	FUSFO :Z	FUSMO :X	FUSMO :Y
LPU1	.32526	196.95	-9119.7	-2757.3	-140.54	-459.14	.41181E-02	231.41	0.	0.
LPU2	.32080	-65.857	-3367.8	1202.0	136.99	-432.45	.41942E-02	53[illegible].36	0.	0.
LPU3	.14804	100.84	-9120.0	-2531.8	-143.03	-459.38	.74737 -03	84.529	0.	0.
LPU4	.14193	-10[illegible].36	-3003.7	1414.1	136.66	-435.54	.76526E-03	297.2[illegible]	0.	0.

	FUSMO :Z	JETHS	JETFO :X	JETFO :Y	JETFO :Z	JETMO :X	JETMO :Y	JETMO :Z	LPA D :X	LPA D :Y
LPU1	0.	100.00	98.545	0.	-16.997	0.	-465.60	0.	53[illegible]4.1	64.[illegible]
LPU2	0.	100.00	98.545	0.	-16.997	0.	-465.60	0.	5019.5	6[illegible].473
LPU3	0.	100.00	98.545	0.	-16.997	0.	-465.60	0.	4736.1	22.773
LPU4	0.	100.00	98.545	0.	-16.997	0.	-465.60	0.	4622.0	24.094

	LPAFO :Z	LPAMC :X	LPAMC :Y	LPAMO :Z	HCBLF :X	HCBLF :Y	HCBLF :Z	HCBLM :X	HCBLM :Y	HCBLM :Z
LPU1	-8128.1	-6739.4	-14008.	13443.	0.	0.	0.	0.	0.	0.
LPU2	-3289.0	-6884.5	-9249.2	15323.	0.	0.	0.	0.	0.	0.
LPU3	-5823.4	-6053.7	-11209.	9530.6	0.	0.	0.	0.	0.	0.
LPU4	-6021.1	-5887.2	-6331.8	10609.	0.	0.	0.	0.	0.	0.

	GCPAS	GCFOR :X	GCFOR :Y	GCFOR :Z	FRTMG	GFFOR :X	GFFOR :Y	GFFOR :Z	GERFO :X	GFFFO :Y
LPU1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
LPU2	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
LPU3	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
LPU4	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.

	GERFO :Z	HGRAO :X	HGRAO :Y	HGRAO :Z	CF :X	CF :Y	CF :Z	CM :X	CM :Y	CM :Z
LPU1	0.	0.	0.	0.	3625.6	60.005	1819.0	-6035.2	-20312.	14172.
LPU2	0.	0.	0.	0.	3815.6	61.939	2305.0	-6629.4	-21929.	15109.
LPU3	0.	0.	0.	0.	3247.8	13.315	3594.8	-5673.5	-21648.	9734.4
LPU4	0.	0.	0.	0.	3326.7	14.691	3744.6	-6009.1	-17750.	10413.

	ADA	ALA	BLA	CLAVR	ALAVR	VTR	TWIR	RCTIV :X	RCTIV :Y	RCTIV :Z
LPU1	.15917	.14396E-01	.14400E-01	.33729	.79994E-01	27.241	14.019	-2.9573	.97764E-01	13.703
LPU2	.16196	.14800E-01	.14520E-01	.34215	.79920E-01	27.437	14.041	-2.6165	.97922E-01	13.79.
LPU3	.11974	.14547E-01	.10578E-01	.24002	.59256E-01	22.980	10.360	-2.1854	.72481E-01	10.176
LPU4	.12236	.15032E-01	.10837E-01	.24394	.60081E-01	23.167	10.415	-1.9408	.72634E-01	10.23.

	DSALP	PDACK K	CLAVP	ALAVP	VTP	TWINP	PRPIV :X	PRPIV :Y	PRPIV :Z	DSKLP
LPU1	3.0243	859.08	1.1688	.20748	80.056	57.198	-57.163	0.	-2.0134	30.481
LPU2	3.0802	853.37	1.1742	.19706	78.021	54.905	-54.871	0.	1.9101	28.951
LPU3	2.0116	914.22	1.1093	.20755	80.071	58.035	-58.000	0.	-2.0426	30.493
LPU4	2.0526	950.58	1.1311	.19740	78.088	55.954	-55.821	0.	1.9431	29.004

	PDACK P	LOCAT	GRAT
LPU1	941.63	3.0200	0.
LPU2	939.17	3.0200	0.
LPU3	941.90	3.0200	0.
LPU4	804.43	3.0200	0.

TAIL AERODYNAMIC REGIMES ANGLE OF ATTACK - 1 ANGLE OF SLIDESLIP - 1 ROLLING ANGLE OF ATTACK - 1

SIMULATION TIME = 2.00

	U	V	W	P	Q	R	X	Y	Z	PSI
NULL	19.251	1.9087	-2.8284	-.13669E-01	.25555E-01	.50342E-01	33.727	1.0573	-1003.2	-.1.450..-1
	THETA	PHI	AXCGG	AYCGG	AZCGG	NORMT	NUTMT	VRGUST:X	VRGUST:Y	VRGUST:Z
NULL	.39449E-01	.24936E-01	.77236E-01	.74749E-01	-.27823E-01	9.7015	9.2432	0.	0.	0.
	UMGUST:X	UMGUST:Y	UMGUST:Z	DUGDXM	DUGDYM	DWGDYM	VDRMGT:X	VDRMGT:Y	VDRMGT:Z	CDMGST:X
NULL	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
	UDMGST:X	UDMGST:Y	UDMGST:Z	VDMGST:X	VDMGST:Y	VDMGST:Z	GGRDAC:X	GGRDAC:Y	GGRDAC:Z	RGDMAC:X
NULL	0.	0.	.39778E-01	1.5285	-.71189	0.	0.	0.	0.	0.
	AGGMAC:Z	VTGUST:X	VTGUST:Y	VTGUST:Z	UTGUST:X	UTGUST:Y	UTGUST:Z	DUGDXT	DUGDYT	DV GDYT
NULL	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
	VDXTGT:X	VDXTGT:Y	VDXTGT:Z	DUTGST:X	DUTGST:Y	CDTGST:Z	VCTGST:X	VCTGST:Y	VCTGST:Z	PCITAC:X
NULL	0.	0.	0.	0.	0.	0.	.64778E-01	1.5285	-.71189	0.
	RGUTAC:Y	RGUTAC:Z	RVMGCV:X	RVMGCV:Y	RVMGCV:Z	RCMGCV:X	RCMGCV:Y	RCMGCV:Z	GAMMAM	LAMBDA
NULL	0.	0.	47.721	1.2457	-3.5285	-.16669E-01	.25555E-01	.50342E-01	.49774	2.1072
	ZETAM	LAMBDM	RVTAIL:X	RVTAIL:Y	RVTAIL:Z	RCTAIL:X	RCTAIL:Y	RCTAIL:Z	ALT	PALT
NULL	-2.3325	1.5703	47.677	-3.5272	.12747E-01	-.16669E-01	.25555E-01	.50342E-01	.51686E-03	.5[illegible]
	BETAT	PSITAT	ALPTO	ALPT	PALPT	PALPTO	RHIVEL:X	RHIVEL:Y	RHIVEL:Z	PHIVEL:X
NULL	-.26859	-.26859	-.24532E-01	-.40190E-01	-.40190E-01	-.24532E-01	1.2584	.63C63E-01	1.3911	-.40104
	PHIVEL:Y	PHIVEL:Z	RTIVEL:X	RTIVEL:Y	RTIVEL:Z	PTIVEL:X	PTIVEL:Y	PTIVEL:Z	RCFLWC	PCFLWC
NULL	-.40392	.39974	.87573	-.17432E-02	.31772	.24320	-.31171E-01	.87955E-01	.11326	.97309E-01
	C FLUX C	TIAC	TOLC	ZAVSOT	RHOFOR:X	RHOFOR:Y	RHOFOR:Z	STATEF:X	STATEF:Y	STATEF:Z
NULL	-35.069	1.0001	1.0000	-4.1410	4067.5	1000.0	-.11458E+06	4067.5	1000.0	-.11458E+06
	GAMOFO:X	GAMOFO:Y	GAMOFO:Z	GGMOFO:X	GGMOFO:Y	GGMOFO:Z	RHOWFO:X	RHOWFO:Y	RHOWFO:Z	RHOWFO:X
NULL	0.	0.	0.	0.	0.	0.	-544.39	-1565.9	1239.7	4.5796
	RHOWFO:Y	RHOWFO:Z	HGAAMF:X	HGAAMF:Y	HGAAMF:Z	HGAAMM:X	HGAAMM:Y	HGAAMM:Z	HGGAMF:X	HGGAMF:Y
NULL	-.27378E+06	-.13594E+06	42.973	3974.1	-1954.9	0.	0.	0.	0.	0.
	HGGAMF:Z	HGGAMM:X	HGGAMM:Y	HGGAMM:Z	RHOGFO:X	RHOGFO:Y	RHOGFO:Z	RHOGMC:X	RHOGMO:Y	RHOGMO:Z
NULL	0.	0.	0.	0.	42.973	3974.1	-1954.9	0.	0.	0.
	GHGIFO:X	GHGIFO:Y	GHGIFO:Z	GHGIMO:X	GHGIMO:Y	GHGIMO:Z	HCACFO:X	HCACFO:Y	HCACFO:Z	HCACMO:X
NULL	0.	.14573E-15	.19039E-17	0.	0.	0.	-1832.3	-5211.9	[illegible]	0.
	HCACMO:Y	HCACMO:Z	RHOAF :X	RHOAF :Y	RHOAF :Z	RHOAMO:X	RHOAMO:Y	RHOAMO:Z	HCAGF :X	HCAGF :Y
NULL	23586.	-.39176E+06	-502.42	2338.2	-715.20	4.5796	-.27378E+06	-.13548E+06	3516.0	4774.8
	HOAGF :Z	HOAGMO:X	HOAGMO:Y	HOAGMO:Z	HOTAFO:X	HOTAFO:Y	HOTAFO:Z	HCTAMO:X	HCT.MO:Y	HCT.MO:Z
NULL	-.11539E+06	7.094.	-.33307E+05	-.13594E+06	1733.0	-937.10	-.11444E+06	7109.	-.3[illegible]E+06	-.27724E+
	TAFOR	TOYFOR	TOYFOR	TSZFOR	TSZMOM	TZMOM	RTOMFO:X	RT MFO:Y	RTOMFO:Z	RT MFO:X
NULL	-313.49	1924.7	74.939	-5.3347	1600.5	9302.4	-313.49	1[illegible]	-5.3347	11[illegible]
	RTOMMO:Y	RTOMMO:Z	TGAAMF:X	TGAAMF:Y	TGAAMF:Z	TGAAMM:X	TGAAMM:Y	TGAAMF:Z	TGGAMF:X	TGG MF:Y
NULL	0.	0.	0.	746.04	-454.89	14960.	0.	0.	0.	0.
	TGGAMF:Z	TGGAMM:X	TGGAMM:Y	TGGAMM:Z	RTOGFO:X	RTOGFO:Y	RTOGFO:Z	RTOGMO:X	RTOGMO:Y	RT MFO:Z
NULL	0.	0.	0.	0.	0.	746.04	-454.89	14960.	0.	0.

LPU VARIABLES AT TIME = 2.000

	U	V	W	PHIU	THETU	PSIU	X	Y	Z	PITCH
LPU1	24.423	4.5514	-1.4215	0.	0.	0.	75.012	-78.795	-964.9	0.
LPU2	15.958	4.5020	-2.2057	0.	0.	0.	71.129	84.137	-962.5	0.
LPU3	24.357	.72931	.51422	0.	0.	0.	-.91721	-80.659	-96..23	0.
LPU4	16.026	.73596	-3.7446	0.	0.	0.	-4.3009	82.273	-962.84	0.

	THETA	PSI	XDOT	YDOT	ZDOT	GERIL :X	GERIL :Y	GERIL :Z	IVSCR :X	IVSCR :Y	IVSCR :Z
LPU1	.35000E-01	0.	17.337	73.659	72.554	-43.196	-955.10				
LPU2	-.35000E-01	0.	17.383	73.735	70.243	48.762	-956.61				
LPU3	.35000E-01	0.	17.284	73.449	.02084	-44.952	-952.55				
LPU4	-.35000E-01	0.	17.337	73.580	-1.5895	46.997	-954.36				

	VSUBC :X	VSUBC :Y	VSUBC :Z	VGUST :X	VGUST :Y	VGUST :Z	RVLPU :X	RVLPU :Y	RVLPU :Z	RVPUS :X
LPU1				0.	0.	0.	54.342	3.7980	.67737	104.61
LPU2				0.	0.	0.	45.949	3.8086	-5.1844	2.7004
LPU3				0.	0.	0.	54.274	-.28007E-01	2.5184	102.91
LPU4				0.	0.	0.	46.017	-.17437E-01	-3.7434	-2..978

	RVPUS :Y	RVPUS :Z	RVBUT :X	RVBUT :Y	RVBUT :Z	RVPRP :X	RVPRP :Y	RVPRP :Z	PPIV :X	PPIV :Y
LPU1	10.653	-6.6403	47.300	3.1919	.59154	54.536	11.236	-13.035	-7.2727	-7.3277
LPU2	13.206	-21.777	45.770	3.6903	-5.6844	36.622	13.920	-23.315	9.3272	-9.3976
LPU3	6.0701	-5.6303	54.095	-.17094	2.6184	60.922	7.3653	-9.9CP0	-6.6477	-6.6931
LPU4	5.6312	-11.929	45.636	-.13571	-3.9434	46.411	6.3447	-14.563	5.6062	-5..467

	RPIV :Z	RPIV :X	RPIV :Y	RPIV :Z	PPIV :X	PPIV :Y	PPIV :Z	LCSKE	DELTA	GAPR
LPU1	13.313	-7.2727	-7.3277	13.313	-109.96	0.	-3.6727	4.0848	.979706-02	1.0000
LPU2	17.073	9.3272	-9.3976	17.073	33.921	0.	-1.1908	3.8503	.640914-02	1.0000
LPU3	12.169	-6.6477	-6.6931	12.169	-109.06	0.	-3.6959	4.0036	.976044-02	1.0000
LPU4	10.262	5.6062	-5.6467	10.262	65.389	0.	-2.2762	3.5184	.9..965E-02	1.0000

	LCSPE	DELTA P	GAPP	STHLR	SAILR	SAILR	SGMGR	PTHLR	PAILR	PAILR
LPU1	5.7303	.503495E-01	1.0000	.13466	.45000	1.0000	23.250	0.	0.	0.
LPU2	4.0900	.926C0E-02	1.0000	.27977E-01	.45000	-.60000	23.250	0.	0.	0.
LPU3	5.7303	.494736-01	1.0000	.13250	.45000	1.0000	23.250	0.	0.	0.
LPU4	3.9069	.870006-02	1.0000	.25818E-01	.45000	-.60000	23.250	0.	0.	0.

	THELR	AILR	AILR	UMELR	STHLP	SGMGP	PTHLP	THELP	CPLLP	TR
LPU1	.13466	.45000	.50000	23.250	.80000	125.66	0.	.50000	125.66	6535.9
LPU2	.27977E-01	.45000	-.50000	23.250	0.	125.66	0.	0.	125.66	656..3
LPU3	.13250	.45000	.50000	23.250	.80000	125.66	0.	.50000	12..66	66C6.7
LPU4	.25818E-01	.45000	-.50000	2..250	0.	125.66	0.	0.	125.66	415..3

	QR	RLIFD :X	RDTFD :Y	RDTFC :Z	RCT.D :X	RDTMD :Y	RCTMC :Z	TP	QP	PTLPF :X
LPU1	14083.	2099.0	2916.8	-5141.0	14338.	-25019.	11129.	5476.4	6230.0	5471.4
LPU2	4503.2	-307.72	202.26	-507.73	3945.7	169.21	3606.0	-417.21	103.92	-416.91
LPU3	13005.	2711.0	2970.0	-5244.5	14834.	-24982.	10909.	5349.6	6230.5	5345.0
LPU4	3041.4	-1822.7	1820.9	-3250.4	14101.	11436.	2403.3	-329.62	147.74	-329.39

	PRUPF :Y	PRUPF :Z	PRUPM :X	PRUPM :Y	PRUPM :Z	FUSFD :X	FUSFD :Y	FUSFC :Z	FUSMD :X	FUSMD :Y
LPU1	-33.613	237.70	-6190.1	-3367.8	-691.59	-597.56	-22.810	50.760	0.	0.
LPU2	-.81353	13.001	-103.86	-221.21	-7.7741	-.10043	-35.056	39..35	0.	0.
LPU3	-22.660	223.34	-6202.0	-3154.7	-535.79	-606.07	-8.9424	22.11	0.	0.
LPU4	-.34769	22.187	-147.65	-170.62	.27285	13.726	-6.3737	91.933	0.	0.

	FUSMD :Z	JETMD	JETFD :X	JETFD :Y	JETFD :Z	JETMD :X	JETMD :Y	JETMC :Z	LPA.D :X	LPA.D :Y
LPU1	0.	100.00	98.543	0.	-16.997	0.	-465.60	0.	7e71.4	28.0..
LPU2	0.	100.00	98.543	0.	-16.997	0.	-465.60	0.	-62..23	24..39
LPU3	0.	100.00	98.543	0.	-16.997	0.	-465.60	0.	7..9.5	29....
LPU4	0.	100.00	98.543	0.	-16.997	0.	-465.60	0.	-2019.9	1e20.2

	LPARO SZ	LPARO SX	LPARO SY	LPARG SZ	MCSLF SX	MCBLF SY	MCBLF SZ	MCBLR SX	MCBLR SY	MCBLP SZ
LPU1	-4919.7	6141.5	-26012.	10137.	0.	0.	0.	0.	0.	0.
LPU2	-202.57	3841.9	-517.01	35[illegible]	0.	0.	0.	0.	0.	0.
LPU3	-5014.1	6031.6	-26002.	10373.	0.	0.	0.	0.	0.	0.
LPU4	-3171.2	15954.	16000.	2403.6	0.	0.	0.	0.	0.	0.

	GCPRS	GCFUR SX	GCFUR SY	GCFUR SZ	FRTMG	GFFUR SX	GFFUR SY	GFFCP SZ	GER-O SX	GF--G SY
LPU1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
LPU2	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
LPU3	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
LPU4	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.

	GENFO SZ	MGR-O SX	MGRAD SY	MGRAD SZ	CF SX	CF SY	CF SZ	CM SX	CM SY	CM SZ
LPU1	0.	0.	0.	0.	5091.9	1891.0	4738.6	13864.	-45159.	82[illegible]4.7
LPU2	0.	0.	0.	0.	-613.50	-593.73	8226.9	1709.1	684.31	2169.5
LPU3	0.	0.	0.	0.	5498.0	2793.0	4707.6	17058.	-44355.	22[illegible]
LPU4	0.	0.	0.	0.	-1167.0	1604.1	5329.4	19045.	16433.	15[illegible]

	AOX	AAX	SIA	CLARK	ALAVP	VIA	T.INR	PCTIV SX	PCTIV SY	PCTIV SZ
LPU1	.13117	.14015E-01	.94030E-02	.22360	.62083E-01	23.621	10.529	-4.[illegible]4	-4.379[illegible]	8.[illegible]C3
LPU2	.32700E-01	.16744E-02	.40779E-02	.23489E-01	.60190E-02	7.4981	13.504	5.8295	-5.[illegible]736	10.[illegible]
LPU3	.13149	.17594E-01	.11037E-01	.22634	.62621E-01	23.749	9.0244	-4.154[illegible]	-4.1[illegible]63	7.[illegible]4
LPU4	.61701E-01	.26424E-02	.60069E-02	.10127	.49835E-01	16.836	8.1166	3.5039	-3.3304	6.41[illegible]

	DSKLR	PLACK K	CLAVP	ALAVP	VTP	THINP	PRPIV SX	PRPIV SY	PRPIV SZ	ESHLP
LPU1	2.0536	39[illegible].34	1.3047	.27657	92.429	66.770	-68.727	0.	-2.[illegible]205	40.[illegible]3.
LPU2	.20660	192.90	-.12073	-.23516E-01	-25.512	-21.214	21.201	0.	-.73901	-3.[illegible]954
LPU3	2.0524	303.39	1.3460	.27616	91.353	65.703	-65.660	0.	-2.3124	39.[illegible]91
LPU4	1.0675	126.57	-.95333E-01	-.24414E-01	-22.670	-40.893	40.868	0.	-1.4226	-2.4456

	PLAR P	LULAT	SRAI
LPU1	14[illegible]	3.3200	0.
LPU2	23.743	3.3200	0.
LPU3	141[illegible].0	3.3200	0.
LPU4	33.753	3.3200	0.

TAIL AERODYNAMIC REGIMES   ANGLE OF ATTACK - 1   ANGLE OF SLID SLIP - 1   ROLLING ANGLE OF ATTACK - 1
VORTEX RING STATE--ROTOR LPU-2
VORTEX RING STATE--PROPELLER LPU-4
MAXIMUM MECHANICAL LIMIT DISK-1
MAXIMUM MECHANICAL LIMIT THEOP-1
MAXIMUM MECHANICAL LIMIT DISK-2
MAXIMUM MECHANICAL LIMIT DISK-3
MAXIMUM MECHANICAL LIMIT THEOP-3
MAXIMUM MECHANICAL LIMIT DISK-4

* *

39 IMSL OVERA WAS UNABLE TO REACH THE SPECIFIED ERROR CRITERIA WITHOUT GOING BELOW THE MINIMUM TIME ST .
SUBROUTINE IATOIA
ERROR TOL = .10000000E-03
EST. ERROR = .42740209E-09
TIME = .22316400E+01

ORIGINAL PAGE IS
OF POOR QUALITY

SIMULATION TIME -- 3.00

	U	V	W	P	Q	R	X	Y	Z	PHI
NULL	21.684	3.2421	-3.2613	.35487E-02	.20169E-01	.85905E-01	53.862	4.7469	-1077.3	-.19700E-01
	THETA	PSI	AXCGG	AYCGG	AZCGG	NDHHT	NDTHT	VPGUST:X	VPGUST:Y	VPGUST:Z
NULL	.39600E-01	.49301E-01	.62123E-01	.92096E-01	-.17400E-01	9.9466	9.2606	0.	0.	0.
	UHGUST:X	UHGUST:Y	UHGUST:Z	DUGDXH	DUGDYH	DVGDYH	VDRHGT:X	VDRHGT:Y	VDRHGT:Z	PHGUST:X
NULL	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
	UDHGST:Y	UDHGST:Z	VDHGST:X	VDHGST:Y	VDHGST:Z	GGRDAC:X	GG DAC:Y	GGRDAC:Z	PGDHAC:X	PGDHAC:Y
NULL	0.	0.	.27711	2.5553	-.61139	0.	0.	0.	0.	0.
	PGDHAC:Z	VTGUST:X	VTGUST:Y	VTGUST:Z	UTGUST:X	UTGUST:Y	UTGUST:Z	DUGDXT	DUGDYT	DVGDYT
NULL	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
	VDRTGT:X	VDRTGT:Y	VDRTGT:Z	DDTGST:X	DDTGST:Y	DDTGST:Z	VDTGST:X	VDTGST:Y	VDTGST:Z	PGDTAC:X
NULL	0.	0.	0.	0.	0.	0.	.27711	2.5553	-.61139	0.
	PGDTAC:Y	PGDTAC:Z	RVHLCV:X	RVHLCV:Y	RVHLCV:Z	RDHLCV:X	RDHLCV:Y	RDHLCV:Z	GAMAH	LAMDSH
NULL	0.	0.	51.621	1.0509	-2.6653	.35487E-02	.20169E-01	.85905E-01	.23046	2.7666
	ZETAH	LAMDPH	RVTAIL:X	RVTAIL:Y	RVTAIL:Z	RDTAIL:X	RDTAIL:Y	RDTAIL:Z	ALT	PALT
NULL	-2.5354	1.5708	50.332	-6.9999	.25759E-01	.35487E-02	.20169E-01	.85905E-01	.20453E-02	.20453E-02
	BETAT	PBETAT	ALPTO	ALPT	PALPT	PALPTO	RHIVEL:X	RHIVEL:Y	RHIVEL:Z	PHIVEL
NULL	-.33290	-.33290	.38778E-02	-.23394E-01	-.23394E-01	.38778E-02	-.58781	-.75907E-01	.84439	.13250
	PHIVEL:Y	PHIVEL:Z	RTIVEL:X	RTIVEL:Y	RTIVEL:Z	PTIVEL:X	PTIVEL:Y	PTIVEL:Z	RCFLW	PCFLW
NULL	-.49492	.56377	.56702	-.68988E-02	.21279	.24631	-.27852E-01	.89082E-01	.12765	.95200E-01
	C FLOW C	TAAC	TLLC	ZAVSQT	RHBFOR:X	RHBFOR:Y	RHBFOR:Z	STATBF:X	STATBF:Y	STATBF:Z
NULL	-34.293	1.0001	1.0000	-4.1410	6836.6	2256.7	-.11454E+06	6836.6	2256.7	-.11454E+06
	GAMBFO:X	GAMBFO:Y	GAMBFO:Z	GGHBFO:X	GGHBFO:Y	GGHBFO:Z	RHOBFO:X	RHOBFO:Y	RHOBFO:Z	PHOBFO:X
NULL	0.	0.	0.	0.	0.	0.	-727.63	-3069.6	893.10	-.16549
	RHOBMO:Y	RHOBMO:Z	HGAAMF:X	HGAAMF:Y	HGAAMF:Z	HGAAMM:X	HGAAMM:Y	HGAAMM:Z	HGGAMF:X	HGGAMF:Y
NULL	-.22001E+06	-.16965E+06	183.83	6043.9	-1589.6	0.	0.	0.	0.	0.
	HGGAMF:Z	HGGAMM:X	HGGAMM:Y	HGGAMM:Z	RHOGFO:X	RHOGFO:Y	RHOGFO:Z	RHOGMO:X	RHOGMO:Y	RHOGPO:Z
NULL	0.	0.	0.	0.	183.83	6043.9	-1589.6	0.	0.	0.
	GHCIFO:X	GHCIFO:Y	GHCIFO:Z	GHCIMO:X	GHCIMO:Y	GHCIMO:Z	HCACFO:X	HCACFO:Y	HCACFO:Z	HCACPO:X
NULL	0.	.66113E-16	.13420E-17	0.	0.	0.	-1617.9	-3672.7	341.41	0.
	HCACMO:Y	HCACMO:Z	RHOAF :X	RHOAF :Y	RHOAF :Z	RHOAMO:X	RHOAMO:Y	RHOAMO:Z	HCAAF :X	HCAAF :Y
NULL	22027.	-.21 0996+06	-543.80	3574.3	-694.53	-.16549	-.22001E+06	-.16965E+06	6272.6	5831.6
	HOAAF :Z	HOA MO:X	HOAAMO:Y	HOAAPO:Z	HOTAFO:X	HOTAFO:Y	HOTAFO:Z	HCTAMO:X	HCT MO:Y	HOTAPO:Z
NULL	-.11523E+06	90970.	-.32486E+06	-.16965E+06	4074.4	2158.3	-.11486E+06	90970.	-.32030E+06	-.2 C96E+06
	TAFOR	TSYFOX	TLYFOX	TSZFOX	TSLMOM	TLLMOM	RTOWFO:X	RTOWFO:Y	RTOWFO:Z	RTOWPO:Z
NULL	-349.35	2791.6	-14.524	-27.757	2608.2	4802.2	-349.35	2777.0	-27.757	7410.4
	RTOWMO:Y	RTOWMO:Z	TGAAMF:X	TGAAMF:Y	TGAAMF:Z	TGAAMM:X	TGAAMM:Y	TGAAMM:Z	TGGAMF:X	TGGAMF:Y
NULL	0.	0.	0.	1250.6	-369.89	25010.	0.	0.	0.	0.
	TGGAMF:Z	TGGAMM:X	TGGAMM:Y	TGGAMM:Z	RTOGFO:X	RTOGFO:Y	RTOGFO:Z	RTOGMO:X	RTOGMO:Y	RTOGPO:Z
NULL	0.	0.	0.	0.	0.	1250.6	-369.89	25010.	0.	0.

	TCALFO:X	TCALFO:Y	TCALFO:Z	TCACMO:X	TCACMO:Y	TCACMO:Z	RTOAF :X	RTOAF :Y	RTOAF :Z	RTOA :X
NULL	0.	434.89	412.83	4964.7	24.386	-119.63	-349.35	4027.6	-397.65	32420.

	RTOAMO:Y	RTOAMO:Z	TCAFOR:X	TOAFOR:Y	TOAFOR:Z	TOAMOM:X	TCAMOM:Y	TCAMOM:Z	TCTAFO:X	TCTAFO:Y
NULL	0.	0.	-349.35	4027.6	-397.65	99400.	-28256.	-.27952E+06	-349.35	4467.

	TOTAFO:Z	TOTAMO:X	TCTAMO:Y	TCTAMO:Z	HABFOR:X	HABFOR:Y	HABFOR:Z	HABMOM:X	HABMOM:Y	HABMOM:Z
NULL	15.227	37405.	24.388	-119.63	5943.4	9858.7	-.11563E+06	.19637E+06	-.32291E+06	-.44917E+

	HBALFO:X	HBALFO:Y	HBALFO:Z	HBACMO:X	HBACMO:Y	HBACMO:Z	HTOTAF:X	HTOTAF:Y	HTOTAF:Z	HTOTAF:X
NULL	-1017.9	-3237.9	7021.31	-43681.	85083.	-.14916E+06	4325.6	6620.8	-.11487E+06	.14754E+06

	HTOTAM:Y	HTOTAM:Z	HCBLFO:X	HCBLFO:Y	HCBLFO:Z	HCBLMO:X	HCBLMO:Y	HCBLMO:Z	HGEAFO:X	HGEAFO:Y
NULL	-.26723E+06	-.59833E+06	0.	0.	0.	0.	0.	0.	0.	0.

	HGEAMO:Z	HGEAMO:X	HGEAMO:Y	HGEAMO:Z	MORLOD:X	MORLOD:Y	MORLOD:Z	MOZLOD:X	MOZLOD:Y	MOZLOD:Z
NULL	0.	0.	0.	0.						

	UCOM	VCOM	WDTCOM	PHICOM	THECOM	TRTCOM	PHREF:X	PHREF:Y	PHREF:Z	PHREF:PSI
NULL	30.000	0.0000	5.0000	.20000	.10000	.30000				

	VMSENS:X	VMSENS:Y	VMSENS:Z	XSPEED	YSPEED	ZSPEED	AXACC	AYACC	AZACC	ROLLRT
NULL	50.630	.53909	-1.4371	21.684	3.2421	4.5105	1.9923	2.9631	-.55984	.35487 -01

	PICMRT	TOAMRT	IACELC:X	IACELC:Y	IACELC:Z	UERR	VERR	WDTERR	PHIERR	THEERR
NULL	.20109E-01	.65903E-01				8.3163	2.7579	.48947	.21970	.40394E-01

	TRATER	IERR:X	IERR:Y	IERR:Z	PSIERR	UINT	VINT	WDTINT	PHIINT	THEINT
NULL	.21409					.13521	.11037E-01	.48957E-01	.77091E-02	.31470E-01

	TRTINT	UCONTL	VCONTL	WDCNTL	PCONTL	QCONTL	RCONTL	SDLTAL	SDLTEL	SDLTRD
NULL	.27042E-01	.40000	.40000	-.59824E-01	.54571E-01	-.42667E-02	.40000	-.54571E-01	.42667E-02	-.40000

	PDLTAL	PDLTEL	PDLTRD	DELTAL	DELTEL	DELTRD
NULL	0.	0.	0.	-.54571E-01	.42667E-02	-.40000

LPU VARIABLES AT TIME = 3.00

	U	V	W	PHID	THETD	PSID	X	Y	Z	PHI
LPU1	29.605	6.3577	-3.1807	0.	0.	0.	101.45	-71.873	-968.6-	C.
LPU2	15.340	6.3758	-4.2800	0.	0.	0.	86.334	90.393	-971.56	C.
LPU3	29.555	-.17107	-1.5486	0.	0.	0.	25.916	-78.919	-964.12	C.
LPU4	15.393	-.15303	-2.5481	0.	0.	0.	10.797	83.346	-967.33	0.

	THETA	PSI	NORMT	NORMT	GERIL :X	GERIL :Y	GERIL :Z	IVSOR :X	IVSIR :Y	IVSOR :Z
LPU1	.35000E-01	0.	17.422	74.043	90.767	-36.478	-959.93	I	I	
LPU2	-.35000E-01	0.	17.480	74.214	88.116	55.096	-961.74	I	I	
LPU3	.35000E-01	0.	17.341	73.698	25.205	-43.154	-955.64	I	I	
LPU4	-.35000E-01	0.	17.399	73.869	16.554	48.421	-957.45	I	I	

	VSURC :X	VSURC :Y	VSURC :Z	VGUST :X	VGUST :Y	VGUST :Z	RVLPU :X	RVLPU :Y	RVLPU :Z	RVPOS :X
LPU1	I	I	I	0.	0.	0.	59.347	3.5067	-.41420	165.00
LPU2	I	I	I	0.	0.	0.	45.199	3.5548	-3.5002	-25.654
LPU3	I	I	I	0.	0.	0.	59.294	-2.9921	1.1177	166.70
LPU4	I	I	I	0.	0.	0.	45.253	-2.9740	-1.0683	-18.361

	RVPOS :Y	RVPOS :Z	RVROT :X	RVROT :Y	RVROT :Z	RVPRP :X	RVPRP :Y	RVPRP :Z	RPIV :X	RPIV :Z
LPU1	7.5981	-9.6011	50.598	3.0257	-.35398	54.987	8.6045	-8.9038	-4.5407	-4.5751
LPU2	6.7805	-7.6055	43.058	3.6006	-3.5002	41.997	7.9807	-9.6429	3.2015	-3.2257
LPU3	1.8706	-4.1018	59.152	-2.9883	1.1177	64.120	3.0743	-7.9989	-4.5262	-4.5627
LPU4	2.2302	-8.9507	41.714	-2.7076	-1.0201	34.227	3.4480	-11.002	4.9461	-4.9635

	RPIV :Z	RFIV :X	RFIV :Y	RFIV :Z	PFIV :X	PFIV :Y	PFIV :Z	LCSRE	DELTA R	GLOR
LPU1	8.3117	-4.3407	-4.3751	8.3117	-109.73	0.	-3.8640	3.8667	.89568E-02	1.0000
LPU2	5.8603	3.2015	-3.2257	5.8603	87.651	0.	-2.3550	3.6864	.84477E-02	1.0000
LPU3	8.8342	-4.8262	-4.8627	8.8342	-102.64	0.	-3.6147	3.9587	.92204E-02	1.0000
LPU4	9.0537	4.9461	-4.9835	9.0537	55.309	0.	-1.9253	3.7704	.84090E-02	1.0000

	LCSPL	DELTA P	GORP	STHLR	SAISR	SBISR	SOMGR	PTHLR	PAISR	PBISR
LPU1	5.7300	.30201E-01	1.0000	.11013	.45000	1.0000	23.250	C.	C.	0.
LPU2	3.9395	.87000E-02	1.0000	.98603E-03	.45000	-.60000	23.250	0.	0.	C.
LPU3	5.7300	.45731E-01	1.0000	.11966	.45000	1.0000	23.250	C.	C.	C.
LPU4	3.7742	.87000E-02	1.0000	.95194E-02	.45000	-.60000	23.250	C.	C.	C.

	THEOP	AISA	BISA	OMEGR	STHLP	SOMGP	PTHLP	THEOP	CPEGP	TR
LPU1	.11013	.45000	.50000	23.250	.80000	125.66	0.	.50000	125.66	4161.6
LPU2	.98603E-03	.45000	-.50000	23.250	0.	125.66	0.	0.	125.66	2389.4
LPU3	.11966	.45000	.50000	23.250	.80000	125.66	0.	.50000	125.66	5101.2
LPU4	.95194E-02	.45000	-.50000	23.250	0.	125.66	0.	0.	125.66	3300.1

	QA	ROTFO :X	ROTFO :Y	ROTFO :Z	ROTMO :X	ROTMO :Y	ROTMO :Z	TP	CP	PROPF :X
LPU1	10125.	1719.0	1840.7	-3314.5	3513.9	-1e437.	8000.6	5456.6	6201.0	5452.1
LPU2	3523.2	-1048.6	1039.6	-1879.8	8798.4	5794.0	2784.1	-352.82	147.72	-352.59
LPU3	11455.	2089.5	2269.7	-4035.7	11055.	-19e10.	9052.3	5284.6	6207.3	5286.2
LPU4	3009.1	-1438.0	1443.2	-2596.3	11427.	8730.7	2425.3	-235.83	147.72	-235.67

	PROPF :Y	PROPF :Z	PROPM :X	PROPM :Y	PROPM :Z	FUSFO :X	FUSFO :Y	FUSFO :Z	FUSMO :X	FUSMO :Y
LPU1	-25.972	2.4.73	-6197.2	-3146.3	-581.86	-598.96	-11.604	14.891	C.	0.
LPU2	-.43727	12.722	-147.63	-178.11	-.96267	14.478	-9.2410	31.705	C.	0.
LPU3	-9.5692	2.7.88	-6203.4	-3050.4	-352.44	-611.78	-.70334	10.869	C.	C.
LPU4	-.10892	8.7413	-147.63	-122.38	2.4941	7.4172	-.99974	51.754	C.	C.

	FUSMO :Z	JETMS	JETFO :X	JETFO :Y	JETFO :Z	JETMO :X	JETMO :Y	JETMO :Z	LPA-O :X	LPA-C :Y
LPU1	0.	100.00	90.545	0.	-16.997	0.	-465.60	0.	6670.0	1.03.1
LPU2	0.	100.00	90.545	0.	-16.997	0.	-465.60	C.	-1216.2	10[illegible].0
LPU3	0.	100.00	90.545	0.	-16.997	C.	-465.60	C.	6654.5	2275.5
LPU4	0.	100.00	90.545	0.	-16.997	0.	-465.60	C.	-1557.7	1412.0

	LPARC :Z	LPARC :X	LPARC :Y	LPARJ :Z	HCBLF :X	HCBLF :Y	HCBLF :Z	HCBLM :	HCBLM :Y	HCBLP :X
LPU1	-3071.6	2316.7	-20548.	7415.3	0.	0.	0.	C.	C.	C.
LPU2	-1352.3	3830.6	5150.3	27 3.1	0.	C.	C.	C.	C.	C.
LPU3	-3844.0	4691.4	-23126.	8019.9	0.	0.	C.	C.	C.	C.
LPU4	-2552.8	11260.	8142.7	2427.8	0.	C.	C.	C.	C.	C.

	GCPAS	GCFOR :X	GCFOR :Y	GCFOR :Z	FXTMG	GFFOR :X	GFFOR :Y	GFFOR :Z	GERFO :X	GERFC :Y
LPU1	0.	0.	0.	0.	0.	0.	0.	0.	C.	C.
LPU2	0.	0.	0.	0.	0.	0.	0.	C.	C.	C.
LPU3	0.	0.	0.	0.	0.	0.	0.	C.	C.	C.
LPU4	0.	0.	0.	0.	0.	0.	0.	C.	C.	C.

	GERFO :Z	MGRMO :X	MGRMO :Y	MGRMO :Z	CF :X	CF :Y	CF :Z	CM :X	CM :Y	CM :Z
LPU1	0.	0.	0.	0.	4915.2	498.25	6225.5	38c9.3	-33179.	[illegible]
LPU2	0.	0.	0.	0.	-1405.9	60.090	6687.3	8595.2	9111.0	15-7.1
LPU3	0.	0.	0.	0.	4959.2	1625.2	5607.0	9826.1	-27303.	71[illegible]
LPU4	0.	0.	0.	0.	-1308.1	1120.0	6117.1	14493.	13490.	174[illegible]

	AUX	MAX	SAX	CLAYR	ALAYR	VTX	TWINR	ACTIV :X	ACTIV :Y	CTIV :Z
LPU1	.922[illegible]E-01	.12061E-01	.45597E-02	.10148	.41762E-0.	10.849	6.5739	-2.8379	-2.2594	5.1[illegible]
LPU2	.96119E-01	-.33293E-02	.20522E-02	.92712E-01	.23150E-01	14.232	4.0350	2.0009	-2.0161	3.[illegible]
LPU3	.10753	.17107E-01	.62133E-02	.14793	.49496E-01	20.868	6.4872	-3.0184	-3.0392	5.[illegible]
LPU4	.[illegible]E-01	-.[illegible]E-03	.33503E-02	.12805	.33961E-01	16.785	7.1602	3.0913	-3.1147	5.[illegible]

	USAYR	PUAYR K	CLAYP	ALAYP	VTP	TWINP	PRPIV :X	PRPIV :Y	PRPIV :Z	CSKLP
LPU1	1.0897	927.99	1.0790	.27557	92.262	69.620	-68.584	0.	-2.4154	4C.48[illegible]
LPU2	.97013	494.44	-.10210	-.25914E-01	-23.461	-42.307	42.282	C.	-1.4713	-2.[illegible]177
LPU3	2.0711	909.25	1.0292	.26880	93.796	64.188	-64.149	C.	-2.2592	39.2[illegible]
LPU4	1.3399	467.74	-.86244E-01	-.16082E-01	-19.181	-34.589	34.560	C.	-1.2033	-1.7497

	PUALR K	CLAST	SRAT
LPU1	1413.[illegible]	3.[illegible]	0.
LPU2	35.791	3.[illegible]	0.
LPU3	1413.[illegible]	3.[illegible]	0.
LPU4	35.749	3.[illegible]	0.

TAIL AERODYNAMIC REGIMES ANGLE OF ATTACK - 1 ANGLE OF SLIDESLIP - . ROLLING ANGLE 0 ATTACK - 1
VORTEX RING STATE--PROPELLER LPU-2
VORTEX RING STATE--PROPELLER LPU-4
MAXIMUM MECHANICAL LIMIT BISA-1
MAXIMUM MECHANICAL LIMIT THRUP-1
MAXIMUM MECHANICAL LIMIT BISA-2
MAXIMUM MECHANICAL LIMIT BISA-3
MAXIMUM MECHANICAL LIMIT THRUP-3
MAXIMUM MECHANICAL LIMIT BISA-4

SIMULATION TIME -- 4.00

U	V	W	P	Q	R	X	Y	Z	PHI
NULL 23.880	4.1510	-3.2030	.19920E-01	.12935E-01	.11440	75.631	11.574	-1012.1	-.3 597.-
THETA	PSI	AXCGG	AYCGG	AZCGG	NORMT	NDTMT	VMGUST:X	VMGUST:Y	VMGUST:Z
NULL .77377E-01	.19352	.47891E-01	.11040	-.39465E-02	9.9870	9.2900	0.	0.	0.
OMGUST:X	OMGUST:Y	OMGUST:Z	DUDCXM	DUDDYM	DVDDYM	VDRMGT:X	VDRMGT:Y	VDRMGT:Z	CP GST:A
NULL 0.	0.	0.	0.	0.	0.	0.	0.	0.	C.
UDMGST:Y	UDMGST:Z	VDMGST:X	VDMGST:Y	VDMGST:Z	GGRDAC:X	GGRDAC:Y	GGR AC:Z	PGDMAC:X	PGDMAC:
NULL 0.	0.	.68956	3.3127	-.47461	0.	0.	C.	C.	C.
MGDMAC:Z	VTGUST:X	VTGUST:Y	VTGUST:Z	CTGUST:X	CTGUST:Y	CTGUST:Z	DUDDX	DUDDYT	DVDDYT
NULL 0.	0.	0.	0.	0.	0.	C.	0.	0.	C.
VDRTGT:X	VDRTGT:Y	VDRTGT:Z	UDTGST:X	UDTGST:Y	UDTGST:Z	VDTGST:X	VDTGST:Y	VDTGST:Z	PGDTAC:X
NULL 0.	0.	0.	0.	0.	C.	.68956	3.3127	-.47461	C.
MGDTAC:Y	MGDTAC:Z	RVHLCV:X	RVHLCV:Y	RVHLCV:Z	RCHLCV:X	RCHLCV:Y	RCHLCV:Z	GAMMAH	LAMDAH
NULL 0.	0.	53.042	-.90723	-1.9438	.19920E-01	.12935E-01	.11440	.11258	-2.7047
ZETAH	LAMDPH	RVTAIL:X	RVTAIL:Y	RVTAIL:Z	RCTAIL:X	RCTAIL:Y	RCTAIL:Z	ALT	PALT
NULL 2.6175	1.5700	52.290	-11.304	-.22986E-01	.19920E-01	.12935E-01	.11440	.1 034- -02	.1 C34.-
BETAT	PSITAT	ALPT,	ALPT	PALPT	PALPT,	RHIVEL:X	RHIVEL:Y	RHIVEL:Z	PHIVEL:X
NULL -.40761	-.40761	.26950E-01	-.46134E-02	-.45184E-02	.26950E-01	-.86885	.11981	.69677	.68856E-0
PHIVEL:Y	PHIVEL:Z	RTIVEL:X	RTIVEL:Y	RTIVEL:Z	PTIVEL:X	PTIVEL:Y	PTI EL:Z	RCFLWC	PCFLWC
NULL -.49984	.35744	.49390	.23724E-01	.17430	.25128	-.23431E-01	.9C879E-01	.10294	.94917.-0
C FLOW C	TIAC	TCLC	ZAVSGT	RHBFOR:X	RHBFOR:Y	RHBFOR:Z	STATBF:X	STATBF:Y	STATBF:Z
NULL -33.590	1.0001	1.0000	-4.1410	8871.3	45.308	-.11442E+06	8871.3	45.308	-.11442.+06
GAMBFO:X	GAMBFO:Y	GAMBFO:Z	GGHBFO:X	GGHBFO:Y	GGHBFO:Z	RHOWFO:X	RHOWFO:Y	RHOWFO:Z	RHOWFO:X
NULL 0.	0.	0.	0.	0.	C.	-1403.5	-4121.6	625.91	-5.2140
RHOWFO:Y	RHOWFO:Z	HGAAMF:X	HGAAMF:Y	HGAAMF:Z	HGAAMM:X	HGAAMM:Y	HGAAMM:Z	HGGAMF:X	HGGAMF:Y
NULL -.15781E+06	-54015.	457.44	8613.1	-1286.0	0.	0.	0.	C.	C.
HGGAMF:Z	HGGAMM:X	HGGAMM:Y	HGGAMM:Z	RHO FO:X	RHOGFO:Y	RHOGFO:Z	RHOGPO:X	RHO MO:Y	RHOGPO:
NULL 0.	0.	0.	0.	457.44	8613.1	-1286.0	C.	C.	C.
GHCIFO:X	GHCIFO:Y	GHCIFO:Z	GHCIMO:X	GHCIMO:Y	GHCIMO:Z	HCACFO:X	HCACFO:Y	HCACFO:Z	HCACPO:X
NULL 0.	-.49691E-16	-.18077E-19	0.	0.	C.	-1446.7	-2504.0	-251.1	C.
HCALMO:Y	HCALMO:Z	RHOAF :X	RHOAF :Y	RHOAF :Z	RHOAMO:X	RHOAMO:Y	RHO MO:Z	HCAAF :X	HCAAF :Y
NULL 26950.	-9501.2	-9460.08	4491.5	-660.07	-5.2140	-.15781E+06	-54015.	7925.2	4536.6
HCAAF :Z	HCAAMO:X	HCAAMO:Y	HCAAMO:Z	HCTAFO:X	HCTAFO:Y	HCTAFO:Z	HCTAPO:X	HCTAMO:Y	HCTAP :Z
NULL -.11506E+06	75442.	-.26961E+06	-54015.	6478.5	2032.5	-.11534E+06	75442.	-.25262E+06	-.14983E+0
TXFOR	TYFOR	TZFOR	TSIFOR	TSIMOM	TDIMOM	RTOWFO:X	RTOWFO:Y	RTOWFO:Z	RTOWPO:X
NULL -377.05	3959.5	-87.537	-21.555	3530.2	1030.0	-377.05	3851.9	-21.555	42.564
RTOWMO:Y	RTOWMO:Z	TGAAMF:X	TGAAMF:Y	TGAAMF:Z	TGAAMM:X	TGAAMM:Y	TGAAMM:Z	TGGAMF:X	TGGAMF:Y
NULL 0.	0.	0.	1621.2	-299.24	32422.	0.	0.	C.	C.
TGGAMF:Z	TGGAMM:X	TGGAMM:Y	TGGAMM:Z	RTOGFO:X	RTOGFO:Y	RTOGFO:Z	RTOGPO:X	RTOMO:Y	RTOGPO:Z
NULL 0.	0.	0.	0.	0.	1621.2	-299.24	32422.	0.	0.

CPU VARIABLES AT TIME = 4.00

	U	V	W	PHID	THETD	PSID	X	Y	Z	P
CPU1	33.683	7.7028	-4.0935	0.	0.	0.	131.37	-60.538	-97[illegible]	0.
CPU2	14.591	7.7269	-[illegible]	0.	0.	0.	100.22	99.459	-97[illegible]	0.
CPU3	33.546	-.99187	-3.111[illegible]	0.	0.	0.	57.009	-75.110	-969.[illegible]	0.
CPU4	15.025	-.96[illegible]	-1.[illegible]7[illegible]	0.	0.	0.	25.863	84.787	-969.[illegible]	0.

	THETA	PSI	NORMT	NORMT	GEAIL :X	GEAIL :Y	GEAIL :Z	IVSCP :X	IVSCP :Y	IVSCP :Z
CPU1	.35000E-01	0.	17.548	74.603	123.39	-25.922	-966.30	I	I	
CPU2	-.35000E-01	0.	17.550	74.534	105.70	64.356	-967.34	I	I	
CPU3	.35000E-01	0.	17.443	74.154	52.947	-39.727	-966.74	I	I	
CPU4	-.35000E-01	0.	17.445	74.086	35.251	50.559	-967.77	I	I	

	VSURC :X	VSURC :Y	VSURC :Z	VGUST :X	VGUST :Y	VGUST :Z	RVLPU :X	RVLPU :Y	RVLPU :Z	RVELS :X
CPU1	I	I	I	0.	0.	0.	63.137	1.9325	-.7[illegible]	17[illegible]
CPU2	I	I	I	0.	0.	0.	44.404	1.9965	-1.[illegible]135	-[illegible].1[illegible]
CPU3	I	I	I	0.	0.	0.	63.103	-6.7622	.1[illegible]04	1[illegible].3[illegible]
CPU4	I	I	I	0.	0.	0.	44.436	-6.7382	-.33116	-24.17[illegible]

	RVELS :Y	RVELS :Z	RVROT :X	RVROT :Y	RVROT :Z	RVPRP :X	RVPRP :Y	RVPRP :Z	RFIX :X	RFIX :Y
CPU1	4.2975	-4.4368	59.373	1.7248	-.74611	57.560	5.5613	-5.3275	-2.4444	-2.4629
CPU2	4.9146	-4.3675	44.313	2.1239	-1.3136	41.468	6.5056	-6.8687	2.[illegible]357	-2.[illegible]561
CPU3	-3.2250	-2.[illegible]897	63.01[illegible]	-6.[illegible]509	.16804	66.[illegible]13	-1.[illegible]151	-6.4182	-3.[illegible]101	-3.[illegible]347
CPU4	-1.7339	-7.1622	44.187	-6.5470	-.3299[illegible]	39.397	-.15821	-9.5[illegible]35	4.[illegible]399	-4.[illegible]773

	RFIX :Z	RFIX :X	RFIX :Y	RFIX :Z	PFIX :X	PFIX :Y	PFIX :Z	LCSRE	DELTA R	CIRR
CPU1	4.4745	-[illegible].4444	-2.4629	4.4745	-107.67	0.	-3.7918	3.7099	.85027E-02	1.0000
CPU2	5.3741	2.4[illegible]59	-2.4[illegible]61	5.3741	66.651	0.	-2.[illegible]201	3.[illegible]608	.84[illegible]94E-02	1.0000
CPU3	6.4252	-3.[illegible]101	-3.[illegible]367	6.4252	-100.73	0.	-3.5474	3.8461	.85[illegible]72E-02	1.0000
CPU4	9.0424	4.[illegible]399	-4.[illegible]773	9.0424	63.490	0.	-2.2101	3.7[illegible]98	.84[illegible]07E-02	1.0000

	LCSRE	DELTA P	G FP	STHLR	SALSR	SBLSR	SCMGR	PTHER	PAISR	PTISR
CPU1	5.7306	.49[illegible]2E-01	1.0000	.96045E-01	.45000	1.0000	23.250	0.	0.	0.
CPU2	3.9251	.87300E-02	1.0000	-.70727E-02	.45000	-.60000	23.250	0.	0.	0.
CPU3	5.7306	.49315E-01	1.0000	.10542	.45000	1.0000	23.250	0.	0.	0.
CPU4	3.8802	.87000E-02	1.0000	.22986E-02	.45000	-.60000	23.250	0.	0.	0.

	THLOR	ALSR	BLSR	GMLOR	STHLP	SCMGP	PTHLP	THLGP	CM[illegible]P	TR
CPU1	.96045E-01	.45000	.50000	23.250	.60000	125.66	0.	.50000	125.66	2533.0
CPU2	-.70727E-02	.45000	-.50000	23.250	0.	125.66	0.	0.	125.66	2136.9
CPU3	.10542	.45000	.50000	23.250	.80000	125.66	0.	.50000	125.66	3897.3
CPU4	.22986E-02	.45000	-.50000	23.250	0.	125.66	0.	0.	125.66	3451.4

	GR	ROTFD :X	ROTFD :Y	ROTFD :Z	ROTMD :X	ROTMD :Y	ROTMD :Z	TP	GP	PR PF :X
CPU1	7965.3	1081.4	1117.9	-2026.7	4404.0	-10667.	6202.7	5400.0	62[illegible]4.3	5[illegible]5.9
CPU2	3930.8	-939.42	926.17	-1682.9	7981.7	5045.[illegible]	2717.4	-342.47	147.71	-342.[illegible]
CPU3	9553.0	1571.9	1742.4	-3103.2	8072.6	-15299.	7548.9	5235.0	62[illegible].4	52[illegible].8
CPU4	2997.4	-[illegible]7.8	1028.4	-2747.8	11734.	9560.8	1896.0	-310.76	147.71	-310.[illegible]5

	PROPF :Y	PROPF :Z	PROPM :X	PROPM :Y	PROPM :Z	FUSFD :X	FUSFD :Y	FUSFC :Z	FUSMD :X	FUSFC :Y
CPU1	-10.953	[illegible].46	-6[illegible]0.4	-2974.[illegible]	-4[illegible].71	-638.16	-3.7121	1.[illegible]335	0.	0.
CPU2	-.35[illegible]3	[illegible].211	-147.[illegible]	-173.9[illegible]	.14343	13.952	-4.[illegible]549	12.37[illegible]	0.	0.
CPU3	5.0704	[illegible].74	-62[illegible].4	-29[illegible].3	-147.46	-61[illegible].0[illegible]	2.0913	4.[illegible]736	0.	0.
CPU4	.[illegible]6652E-[illegible]	11.[illegible]57	-147.62	-157.62	5.2600	12.852	.[illegible]3427	3[illegible].137	0.	0.

	FUSMD :Z	JETMS	JETFD :X	JETFD :Y	JETFC :Z	JETMD :X	JETMD :Y	JETMC :Z	LPA[illegible] :X	LPAFC :Y
CPU1	0.	100.00	98.543	0.	-16.997	0.	-465.60	0.	58[illegible].[illegible]	1097.[illegible]
CPU2	0.	100.00	98.543	0.	-16.997	0.	-465.60	0.	-11[illegible].2	52[illegible].96
CPU3	0.	100.00	98.543	0.	-16.997	0.	-465.60	0.	63[illegible].2	1749.5
CPU4	0.	100.00	98.543	0.	-16.997	0.	-465.60	0.	-1716.[illegible]	15[illegible].0

LPRU	-1629.9	-17826.4	-14607.	5807.0	0.	0.	0.	0.	0.
LPRC	-1607.3	7834.1	4333.0	2747.5	0.	0.	0.	0.	0.
LPRS	-2903.0	166960.	-13769.	7401.0	0.	0.	0.	0.	0.
LPRH	-2720.9	12267.	2937.0	1901.4	0.	0.	0.	0.	0.

LPRU	0.	0.	0.	0.	0.	0.	0.	0.	0.
LPRC	0.	0.	0.	0.	0.	0.	0.	0.	0.
LPRS	0.	0.	0.	0.	0.	0.	0.	0.	0.
LPRH	0.	0.	0.	0.	0.	0.	0.	0.	0.

LPRU	0.	0.	0.	0.	4295.2	-369.55	7156.2	-2834.9	-25174.
LPRC	0.	0.	0.	0.	-1433.5	68.401	6871.5	7873.9	8359.3
LPRS	0.	0.	0.	0.	4391.4	821.97	5305.0	4547.0	-3077.
LPRH	0.	0.	0.	0.	-2230.9	1244.2	6015.0	15166.	15370.

LPRU	-.8037E-01	-.1163E-01	.1493E-02	.3928E-01	.2049E-01	14.705	3.3389	-1.5275	-1.0339
LPRC	.3079E-01	-.4473E-02	.9999E-03	.3679E-01	.2265E-01	13.500	4.2505	1.0349	-1.0423
LPRS	.8023E-01	.1003E-01	.5849E-02	.1122	.3931E-01	18.240	5.0816	-2.1938	-2.0104
LPRH	.8054E-01	-.1003E-01	.3947E-02	.1597	.3974E-01	17.269	7.1519	3.0872	5.0110

LPRU	1.0026	3.3203	1.0268	-.2721	91.783	67.333	-57.292	0.	-2.3699
LPRC	.8078	1.0137	-.2781E-01	-.2524E-01	-23.114	-41.682	41.657	0.	-1.0501
LPRS	1.0023	1.0023	1.0149	.2049	90.370	62.993	-62.954	0.	-2.0171
LPRH	1.0173	1.0146	-.8972E-01	-.2317E-01	-24.018	-39.705	39.681	0.	-1.0913

LPRU	1.0176	0.	
LPRC	1.0074	0.	
LPRS	1.0021	0.	
LPRH	1.0147	0.	

THE ACRONYMS AND ACRONYMS ANGLE OF ATTACK - 1 ANGLE OF SIDESLIP - 1 ROLLING ANGLE OF ATTACK - 1
CENTER WING STALL--PROPELLER RPM-2
CENTER WING STALL--PROPELLER RPM-4
MAXIMUM MECHANICAL LIMIT ELEV-1
MAXIMUM MECHANICAL LIMIT THRUP-1
MAXIMUM MECHANICAL LIMIT ELEV-2
MAXIMUM MECHANICAL LIMIT ELEV-3
MAXIMUM MECHANICAL LIMIT THRUP-3
MAXIMUM MECHANICAL LIMIT ELEV-4

SIMULATION TIME -- 5.00

	U	V	W	P	Q	R	X	Y	Z	PSI
NULL	25.777	4.6257	-3.0093	.27280E-01	.64731E-02	.13978	98.180	22.183	-1017.1	.3[illegible]
	THETA	PHI	AXCGG	AYCGG	AZCGG	NDMHT	NDTHT	VHGUST:X	VHGUST:Y	VHGUST:Z
NULL	.69710E-01	.32128	.31506E-01	.13240	.17961E-03	10.036	9.3300	0.	0.	0.
	UHGUST:X	UHGUST:Y	UHGUST:Z	DUGDXH	DUGDYH	DVGDYH	VDRHGT:X	VDRHGT:Y	VDRHGT:Z	CDHGST:X
NULL	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
	UDHGST:Y	UDHGST:Z	VDHGST:X	VDHGST:Y	VDHGST:Z	GGXDAC:X	GGRDAC:Y	GGRDAC:Z	PCDTAC:X	PCDTAC:Y
NULL	0.	0.	1.3295	3.8900	-.43967	0.	0.	0.	0.	0.
	HGDTAC:Z	VTGUST:X	VTGUST:Y	VTGUST:Z	UTGUST:X	UTGUST:Y	UTGUST:Z	DUGDXT	DUGDYT	DVGDYT
NULL	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
	VDXTGT:X	VDXTGT:Y	VDXTGT:Z	UDTGST:X	UDTGST:Y	CDTGST:Z	VDTGST:X	VDTGST:Y	VDTGST:Z	HGDTAC:X
NULL	0.	0.	0.	0.	0.	0.	1.3295	3.8900	-.43967	0.
	HGDTAC:Y	HGDTAC:Z	RVHLCV:X	RVHLCV:Y	RVHLCV:Z	RCHLCV:X	RCHLCV:Y	RCHLCV:Z	GAMMAH	LAPDAH
NULL	0.	0.	56.559	-3.9743	-1.3726	.27280E-01	.64731E-02	.13978	.45270E-01	-1.6033
	ZETAH	LAMDPH	RVTAIL:X	RVTAIL:Y	RVTAIL:Z	RCTAIL:X	RCTAIL:Y	RCTAIL:Z	ALT	PALT
NULL	1.9495	1.5708	56.323	-16.396	-.20005E-01	.27280E-01	.64731E-02	.13978	-.83100E-04	-.83100E-04
	RETAT	PSITAT	ALPTO	ALPT	PALPT	PALPTO	RHIVEL:X	RHIVEL:Y	RHIVEL:Z	PHIVEL
NULL	-.49283	-.49283	.20137E-01	.49357E-02	.49357E-02	.20137E-01	-.55670	.34745	.63594	.25388E-0[illegible]
	PHIVEL:Y	PHIVEL:Z	RTIVEL:X	RTIVEL:Y	RTIVEL:Z	PTIVEL:X	PTIVEL:Y	PTIVEL:Z	RCHLMC	PCPLMC
NULL	-.97736	.37017	.45739	.74962E-01	.10942	.24155	-.23925E-01	.87361E-01	.97245E-01	.92797E-01
	C PLUM C	T.AC	TCLC	ZAPSGT	RHBFCR:X	RHBFCR:Y	RHBFCR:Z	STATRF:X	STATRF:Y	STATRF:Z
NULL	-33.371	1.0001	1.0000	-4.1410	9710.1	-3945.9	-.11429E+06	9710.1	-3945.9	-.11429E+06
	GAMBFO:X	GAMBFO:Y	GAMBFO:Z	GGHBFO:X	GGHBFO:Y	GGHBFO:Z	RHOBFO:X	RHOBFO:Y	RHOBFO:Z	RHOBMO:X
NULL	0.	0.	0.	0.	0.	0.	-2652.5	-4598.9	673.09	-9.7340
	RHOBMO:Y	RHOBMO:Z	HGAAMF:X	HGAAMF:Y	HGAAMF:Z	HGAAMM:X	HGAAMM:Y	HGAAMM:Z	HGGAMF:X	HGGAMF:Y
NULL	-.10755E+06	43393.	891.97	10114.	-1143.2	0.	0.	0.	0.	0.
	HGGAMF:Z	HGGAMM:X	HGGAMM:Y	HGGAMM:Z	RHOGFO:X	RHOGFO:Y	RHOGFO:Z	RHOGMO:X	RHOGMO:Y	RHOGMO:Z
NULL	0.	0.	0.	0.	891.97	10114.	-1143.2	0.	0.	0.
	GHCIFO:X	GHCIFO:Y	GHCIFO:Z	GHCIMO:X	GHCIMO:Y	GHCIMO:Z	HCACFO:X	HCACFO:Y	HCACFO:Z	HCACMO:X
NULL	0.	-.69264E-15	.23915E-15	0.	0.	0.	-1185.0	-1598.9	-173.43	0.
	HCACMO:Y	HCACMO:Z	RHOAF :X	RHOAF :Y	RHOAF :Z	RHOAMO:X	RHOAMO:Y	RHOAMO:Z	HCABF :X	HCABF :Y
NULL	17001.	-9017.0	-1770.5	5515.2	-402.07	-9.7340	-.10755E+06	43393.	7917.3	15c9.2
	HCABF :Z	HCABMO:X	HCABMO:Y	HCABMO:Z	HCTAFO:X	HCTAFO:Y	HCTAFO:Z	HCTAMO:X	HCTAMO:Y	HCTAMO:Z
NULL	-.11479E+06	20086.	-.23959E+05	43393.	6734.5	-29.690	-.11486E+06	26076.	-.22259E+05	-4782.
	TAFOX	TAYFO	TAYFOA	TSZFOX	TSLMOM	TSLMOM	RTUBFO:X	RTUBFO:Y	RTUBFO:Z	RTUBMO:X
NULL	-392.10	5402.8	-124.08	.97845	4546.8	-1097.8	-392.10	5291.7	.97845	35[illegible]
	RTUBMO:Y	RTUBMO:Z	TGAAMF:X	TGAAMF:Y	TGAAMF:Z	TGAAMM:X	TGAAMM:Y	TGAAMM:Z	TGGAMF:X	TGGAMF:Y
NULL	0.	0.	0.	1903.8	-266.00	38072.	0.	0.	0.	0.
	TGGAMF:Z	TGGAMM:X	TGGAMM:Y	TGGAMM:Z	RTUGFO:X	RTUGFO:Y	RTUGFO:Z	RTUGMO:X	RTUGMO:Y	RTUGMO:Z
NULL	0.	0.	0.	0.	0.	1903.8	-266.00	38072.	0.	0.

	TCALFO:A	TCALFO:Y	TCALFO:Z	TCALMO:X	TCALMO:Y	TCALMO:Z	RTOAF :X	RTOAF :Y	RTOAF :Z	RTOAF :A
NULL	0.	744.08	224.54	14400.	18.324	-97.195	-392.10	7185.5	-265.02	41[illegible]
	RTOAMO:Y	RTOAMO:Z	TOAFOR:X	TOAFOR:Y	TOAFOR:Z	TOAMOM:X	TOAMOM:Y	TOAMOM:Z	TOTAFO:X	TOTAFO:Y
NULL	0.	0.	-392.10	7185.5	-265.02	.16112E+06	-16695.	-.49508E+06	-392.10	7[illegible]9.
	TOTAFO:Z	TOTAMO:X	TOTAMO:Y	TOTAMO:Z	HABFOR:X	HABFOR:Y	HABFOR:Z	HABMOM:X	HABMOM:Y	HABMOM:Z
NULL	-40.485	36021.	18.324	-97.195	7547.5	8794.7	-.11502E+06	.18720E+06	-.25628E+06	-.44[illegible]
	HBACFO:X	HBACFO:Y	HBACFO:Z	HBACMO:X	HBACMO:Y	HBACMO:Z	HTOTAF:X	HTOTAF:Y	HTOTAF:Z	HTOTAF:X
NULL	-1165.0	-834.32	116.11	184.16	56.73.	-.15538E+06	6302.4	7899.9	-.11490E+06	.18739E+
	HTOTAM:Y	HTOTAM:Z	HCBLFO:X	HCBLFO:Y	HCBLFO:Z	HCBLMO:X	HCBLMO:Y	HCBLMO:Z	HGEAFO:X	HGEAFO:Y
NULL	-.19791E+06	-.66207E+06	0.	0.	0.	0.	0.	0.	0.	0.
	HGEAFO:Z	HGEAMO:X	HGEAMO:Y	HGEAMO:Z	PCKLOD:X	PC LOD:Y	MOKLOD:Z	NCZLOD:X	NCZLOD:Y	NCZLOD:Z
NULL	0.	0.	0.	0.	I	I	I	I	I	I
	UCOM	VCOM	WOICOM	PHICOM	THECOM	TRUCOM	PHREF:X	PHREF:Y	PHREF:Z	PHREF:PSI
NULL	30.000	0.0000	5.0000	.20000	.10000	.30000	I	I	I	
	VHSENS:X	VHSENS:Y	VHSENS:Z	XSPEED	YSPEED	ZSPEED	AXACC	AYACC	AZACC	ROLLRT
NULL	53.924	-3.0505	-.33563	25.777	4.0267	5.0716	1.0135	4.2599	.59223E-02	.27286E-01
	PTCHRT	YAWRT	IACCLC:X	IACCLC:Y	IACCLC:Z	UERR	VERR	HDTERR	PHIERR	THTERR
NULL	.04731E-02	.12978	I	I	I	4.2232	1.1733	-.71620E-01	.16545	.15290E-
	TRATER	ILERR:X	ILERR:Y	ILERR:Z	PSIERR	UINT	VINT	HDTINT	PHIINT	THEINT
NULL	.15022	I	I	I	I	.15112	.22350E-01	.49131E-01	.13284E-01	-.44596E-01
	TRTINT	UDLNTL	VDLNTL	WDLNTL	PDLNTL	QDLNTL	RDLNTL	SDLTAL	SDLTEL	SDLTRU
NULL	.24001E-02	.40000	.37433	-.47542E-01	.45419E-01	-.80918E-03	.40000	-.45419E-01	.80918E-03	-.40000
	PDLTAL	PDLTEL	PDLTRU	DELTAL	DELTEL	DELTRU				
NULL	0.	0.	0.	-.45419E-01	.80918E-03	-.40000				

CPU VARIABLES AT TIME = 0.000

	U	V	W	PHID	THETD	PSID	X	Y		P
CPU1	37.093	9.0494	-4.6230	0.	0.	0.	103.10	-43.490	-98.9	0.
CPU2	14.596	9.0750	-1.0039	0.	0.	0.	112.30	111.29	-97.3	0.
CPU3	37.377	-0.0731	-3.4340	0.	0.	0.	91.244	-67.404	-97.5	0.
CPU4	14.613	-0.0446	-1.0123	0.	0.	0.	40.451	87.380	-97.0	0.

	THETA	PSI	RDOT	RDPHT	GERIL SX	GERIL SY	GERIL SZ	IVSUP SX	IVSUP SY	IVSUP SZ
CPU1	.3500E-01	0.	17.094	75.238	151.05	-10.440	-97.429		I	I
CPU2	-.3500E-01	0.	17.593	74.737	12.027	75.379	-97.012		I	I
CPU3	.3500E-01	0.	17.593	74.737	52.778	-33.101	-97.019		I	I
CPU4	-.3500E-01	0.	17.491	74.245	54.126	54.029	-96.963		I	I

	VSUBC SX	VSUBC SY	VSUBC SZ	VBODT SX	VBODT SY	VBODT SZ	RVLPU SX	RVLPU SY	RVLPU SZ	RVPOS SX
CPU1	I	I	I	0.	0.	0.	62.844	-.23531	-.53099	16.21
CPU2	I	I	I	0.	0.	0.	43.033	-.30602	.19579	-23.546
CPU3	I	I	I	0.	0.	0.	65.127	-10.594	-.93193E-02	167.8
CPU4	I	I	I	0.	0.	0.	43.054	-10.929	.60742	-23.186

	RVPOS SY	RVPOS SZ	RVBOT SX	RVBOT SY	RVBOT SZ	RVPAP SX	RVP P SY	RVPPP SZ	PPIV SX	PPIV SY
CPU1	1.0046	-.97077E-02	99.799	-.17872	-.35696	65.273	2.9967	-3.7434	-1.7331	-1.4222
CPU2	3.3174	-2.7249	92.968	-.36893E-01	.19578	38.012	5.2597	-2.0491	4.4219	-3.2234
CPU3	-3.0847	-1.0499	69.736	-10.892	-.93193E-02	66.353	-6.9156	-4.7321	-2.3311	-2.0740
CPU4	-3.0416	-7.0520	42.692	-10.8 8	.60284	37.359	-4.3723	-9.7355	5.1113	-4.0960

	RPIV SZ	RPIV SX	RPIV SY	BPIV SZ	PPIV SX	PPIV SY	PPIV SZ	LCS<E	DELTA P	GLOB
CPU1	3.1725	-1.7331	-1.4202	3.1725	-13.273	0.	-3.5827	3.0469	.65214E-02	1.0000
CPU2	8.0942	4.4219	-3.0234	8.0942	62.152	0.	-2.1635	3.7374	.89254E-02	1.0000
CPU3	4.0331	-2.0311	-2.0740	4.0331	-99.324	0.	-3.4980	3.7417	.65254E-02	1.0000
CPU4	10.271	5.1113	-4.0960	10.271	63.244	0.	-2.0971	3.0092	.89089E-02	1.0000

	LCSWE	DELTA P	GLOP	STHOP	SAIDP	SEL P	SCRAP	PTH P	PAISP	PTSSP
CPU1	5.7300	.89550 E-01	1.0000	.93151E-01	.37433	1.0000	23.250	0.	0.	0.
CPU2	3.0019	.89089E-02	1.0000	.93128E-03	.37433	-.00000	23.250	0.	0.	0.
CPU3	5.7300	.89089E-01	1.0000	.94770E-01	.37433	1.0000	23.250	0.	0.	0.
CPU4	3.0000	.89089E-02	1.0000	.93168E-02	.37433	-.00000	23.250	0.	0.	0.

	THEUP	ALSA	BISA	UPSUP	STHLP	SCRAP	PTHLP	TPELP	CPELP	TP
CPU1	.93151E-01	.37433	.50000	23.250	.50000	125.65	0.	.50000	125.66	1903.3
CPU2	.93128E-03	.37433	-.50000	23.250	0.	125.66	0.	0.	125.66	2944.3
CPU3	.94770E-01	.37433	.50000	23.250	.50000	125.66	0.	.50000	125.66	2827.0
CPU4	.93168E-02	.37433	-.50000	23.250	0.	125.66	0.	0.	125.66	3716.3

	JA	RDTPC SA	RDTPU SY	RDTPC SZ	RDTPC SX	RDTPD SY	RDT D SZ	TP	CP	PSIFF SA
CPU1	7130.1	790.21	703.34	-1951.2	1752.3	-8159.7	5871.3	5756.6	6237.1	5237.7
CPU2	2974.0	-1324.7	1031.2	-2397.0	8873.6	8203.7	2309.1	-297.77	147.71	-297.60
CPU3	9095.2	1107.1	1007.0	-2334.6	3826.9	-11285.	6012.2	5202.0	6237.0	5197.0
CPU4	2053.2	-1000.4	1374.7	-3024.7	10994.	10668.	1704.3	-279.79	147.71	-279.61

	PRUPP SY	PRUPP SZ	PRUPM SA	PRUPP SY	PRUPM SZ	FUSID SX	FUSPC SY	FUSPC SZ	FUSPD SX	FUSPD SY
CPU1	-9.3715	20.089	-8203.2	-2894.4	-349.67	-630.62	-.23654	.52230E-0	0.	0.
CPU2	-.20815	10.727	-1471.2	-1562.1	1.1041	1 .191	-2.2120	21.491	0.	0.
CPU3	21.441	20.061	-5203.2	-2873.0	87.342	-510.59	15.860	.89408	0.	0.
CPU4	.23956	10.175	-1471.2	-1462.4	8 .927	11.800	7.3295	36.943	0.	0.

	FUSPD SZ	JETPS	JETPU SA	JETPC SY	JETPD SZ	JETPD SX	JETPD SY	JETPC S	LPAPD SA	LPAPC SY
CPU1	0.	100.00	90.593	0.	-16.997	0.	-465.60	0.	5510.8	69.69
CPU2	0.	100.00	90.593	0.	-16.997	0.	-465.60	0.	-1511.5	1.2.7
CPU3	0.	100.00	90.593	0.	-16.997	0.	-465.60	0.	5517.3	1104.7
CPU4	0.	100.00	90.593	0.	-16.997	0.	-465.60	0.	-1813.0	13 .08

	LPWR 1Z	LPWR 2X	LPWR 3Y	LPWR 4Z	HCBLF 1X	HCBLF 2Y	HCBLF 3Z	HCBLM 4X	HCBLM 5Y	HCB M 6Z
LPU1	-13949.4	-49210.	-11900.	5521.7	0.	0.	0.	0.	0.	0.
LPU2	-23310.5	87460.	7307.9	23702.2	0.	0.	0.	0.	0.	0.
LPU3	-21901.1	-23952.	-19023.	8894.0	0.	0.	0.	0.	0.	0.
LPU4	-29949.7	10098.	10279.	17124.1	0.	0.	0.	0.	0.	0.

	UCPUR 1X	UCPUR 2Y	UCPUR 3Z	FRTMG 1X	GFFUR 2Y	GFFUP 3Z	GFFDP 4X	GFR D 5Y	GFFC 6Z
LPU1	0.	0.	0.	0.	0.	0.	0.	0.	0.
LPU2	0.	0.	0.	0.	0.	0.	0.	0.	0.
LPU3	0.	0.	0.	0.	0.	0.	0.	0.	0.
LPU4	0.	0.	0.	0.	0.	0.	0.	0.	0.

	GEAR 1Z	HGRAD 2X	HGRAD 3Y	[illegible] 4Z	CF 1X	CF 2Y	TM1 R	CM 3X	CM 4Y	CM 5Z
LPU1	0.	0.	0.	0.	4006.3	-893.22	73.34	-6901.3	-2214.	4777.
LPU2	0.	0.	0.	0.	-1008.1	409.12	6306.4	98.97	1235.	1745.
LPU3	0.	0.	0.	0.	3900.8	45.904	6701.7	-2016.9	-2567.	6715.
LPU4	0.	0.	0.	0.	-2404.4	1247.5	5917.4	1408.	1719.	1119.

	ADA	ADA	BAR	CLAVR	ALAVR	VTP	TM1 R	RCTIV 1X	RCTIV 2Y	RCTIV 3Z
LPU1	.2409E-01	.1393E-01	.1107E-03	.7784E-01	.2025E-01	14.747	2.4275	-1.0832	-.9376	1.0748
LPU2	.2101E-01	-.1393E-02	.2243E-02	.1142A	.1056E-01	15.554	6.1934	2.7637	-2.2644	5.0559
LPU3	.8033E-01	.1793E-01	.2407E-02	.1037Z	.2932E-01	15.537	3.2451	-1.5819	-1.2963	2.8957
LPU4	.8348E-01	-.1425E-02	.4402E-02	.1441B	.3785E-01	17.811	7.8593	3.5070	-2.1737	6.4156

	JSMAR	PDMAR M	CLAVP	ALAVP	VTP	TM1 P	PRPIV 1Z	PRPIV 2Y	PRPIV 3Z	CSKLP
LPU1	.7727A	303.86	1.0211	.2054?	90.556	63.620	-63.580	C.	-2.2392	39.001
LPU2	1.1954	142.64	-.3017E-01	-.2231E-01	-21.553	-33.806	38.845	C.	-1.3522	-2.2694
LPU3	1.1481	342.21	1.0353	.2327A	90.084	62.116	-62.078	0.	-2.1863	38.596
LPU4	1.0087	83.402	-.3096E-01	-.2110E-01	-20.892	-37.675	37.653	C.	-1.3107	-2.6759

	PDMAR P	LOMAT	UMAI
LPU1	1.0501	1.0200	0.
LPU2	33.749	1.0200	0.
LPU3	1.1709	1.0200	0.
LPU4	33.749	1.0200	0.

TOTAL AERODYNAMIC REGIMES
HUNTER RING STATE--PROPELLER LPU-2
HUNTER RING STATE--PROPELLER LPU-4
MAXIMUM MECHANICAL LIMIT ELSK-1
MAXIMUM MECHANICAL LIMIT THEOP-1
MAXIMUM MECHANICAL LIMIT ELSK-2
MAXIMUM MECHANICAL LIMIT ELSK-3
MAXIMUM MECHANICAL LIMIT THEOP-3
MAXIMUM MECHANICAL LIMIT ELSK-4

ANGLE OF ATTACK - 1

ANGLE OF SLIDESLIP - 1

ROLLING ANGLE OF ATTACK - 1

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                HEAVY LIFT AIRSHIP FLIGHT SIMULATION

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----------RUN DESCRIPTION----------

    PROGRAM KLAPAY      DATE - 81/12/11.      TIME - 10.10.39.

TEST RUN3
BIFILAR CABLES, PAYLOAD DISTURBANCE
CLOSED LOOP

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                                        ****INPUT DATA****

-----------------------------------------------------GEOMETRY INPUTS----------------------------------

------BASIC HULL MEASUREMENTS
HLLSAA =  .1942E+05 FT.**2                          SIDE PROJECTED AREA
HLLDIA =  .1600E+03 FEET                            MAXIMUM DIAMETER
HLLIC  =          1                                 CONFIGURATION ID =
HLLTH  =  .240 E+03 FEET                            LENGTH OF HULL
HLLVOL =  .15  E+07 FT.**3                          TOTAL DISPLACEMENT VOLUME

------BASIC TAIL ASSEMBLY DATA
NLPFIN =          2                                 NUMBER OF FINS
STALOC =  -67.50    0.00    0.00 FEET               TAIL VECTOR FROM HULL CV
TALARA =  .252 E+04           FT.**2                TAIL REFERENCE AREA
TSPAN  =  .1600E+03           FEET                  TAIL SPAN
TAILIC =          1                                 TAIL CONFIGURATION ID =

------BASIC LPU VALUES
NLPLPU =          4                                 NUMBER OF LPUS
LPUIC  =          1                                 CONFIGURATION ID =

------FOUR VECTORS FROM HULL CV REFERENCE AXES TO EACH LPU ATTACH POINT
WATCH1 =  .2100E+02 -.8150E+02  .5300E+02  FEET
WATCH2 =  .2100E+02  .8150E+02  .5300E+02  FEET
WATCH3 = -.3000E+02 -.8150E+02  .5900E+02  FEET
WATCH4 = -.3000E+02  .8150E+02  .5900E+02  FEET

------FOUR VECTORS FROM EACH LPU FUSELAGE REFERENCE AXES TO ITS HULL ATTACH POINT
RLTCH1 =  0.          0.          .3600E+01  FEET
RLTCH2 =  0.          0.          .3600E+01  FEET
RLTCH3 =  0.          0.          .3600E+01  FEET
RLTCH4 =  0.          0.          .3600E+01  FEET

------VECTORS TO THE POSITION OF EACH ROTOR HUB WITH RESPECT TO ITS LPU FUSELAGE REFERENCE AXES
RACTR1 =  0.          0.         -.7200E+01  FEET
RACTR2 =  0.          0.         -.7200E+01  FEET
RACTR3 =  0.          0.         -.7200E+01  FEET
RACTR4 =  0.          0.         -.7200E+01  FEET

------ROTOR CONFIGURATION
NBELC1 =          4                                 NUMBER OF BLADES ROTOR 1
NBELC2 =          4                                 NUMBER OF BLADES ROTOR 2
NBELC3 =          4                                 NUMBER OF BLADES ROTOR 3
NBELC4 =          4                                 NUMBER OF BLADES ROTOR 4

RADIT1 =    28.0000 FEET                            EFFECTIVE RADIUS ROTOR 1
RADIT2 =    28.0000 FEET                            EFFECTIVE RADIUS ROTOR 2
RADIT3 =    28.0000 FEET                            EFFECTIVE RADIUS ROTOR 3
RADIT4 =    28.0000 FEET                            EFFECTIVE RADIUS ROTOR 4

CORD1  =     1.3700 FEET                            BLADE CHORD AT 3/4 RADIUS STATION ROTOR 1
CORD2  =     1.3700 FEET                            BLADE CHORD AT 3/4 RADIUS STATION ROTOR 2
CORD3  =     1.3700 FEET                            BLADE CHORD AT 3/4 RADIUS STATION ROTOR 3
CORD4  =     1.3700 FEET                            BLADE CHORD AT 3/4 RADIUS STATION ROTOR 4
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-----VECTORS TO THE POSITION OF EACH PROPELLER HUB WITH RESPECT TO ITS LPU FUSELAGE REFERENCE AXES
RFACF1 =   .1466E+02 0.          0.          FEET
RFACF2 =   .1466E+02 0.          0.          FEET
RFACF3 =   .1466E+02 0.          0.          FEET
RFACF4 =   .1466E+02 0.          0.          FEET

-----PROPELLER CONFIGURATION
NFELC1 =          3                          NUMBER OF BLADES PROPELLER 1
NFELC2 =          3                          NUMBER OF BLADES PROPELLER 2
NFELC3 =          3                          NUMBER OF BLADES PROPELLER 3
NFELC4 =          3                          NUMBER OF BLADES PROPELLER 4

RACP1  =      6.5500 FEET                    EFFECTIVE RADIUS PROPELLER 1
RACP2  =      6.5500 FEET                    EFFECTIVE RADIUS PROPELLER 2
RACF3  =      6.5500 FEET                    EFFECTIVE RADIUS PROPELLER 3
RACP4  =      6.5500 FEET                    EFFECTIVE RADIUS PROPELLER 4

CCRCF1 =       .6550 FEET                    BLADE CHORD AT 3/4 RADIUS STATION PROPELLER 1
CCRCF2 =       .6550 FEET                    BLADE CHORD AT 3/4 RADIUS STATION PROPELLER 2
CCRCF3 =       .6550 FEET                    BLADE CHORD AT 3/4 RADIUS STATION PROPELLER 3
CCRCF4 =       .6550 FEET                    BLADE CHORD AT 3/4 RADIUS STATION PROPELLER 4

-----LATERAL CONTROL AXIS DEFLECTION FOR:
A1SP1  =      0.0000 RADIANS                 PROPELLER-1
A1SP2  =      0.0000 RADIANS                 PROPELLER-2
A1SP3  =      0.0000 RADIANS                 PROPELLER-3
A1SP4  =      0.0000 RADIANS                 PROPELLER-4

-----LONGITUDINAL CONTROL AXIS DEFLECTION FOR:
B1SP1  =      1.5360 RADIANS                 PROPELLER-1
B1SP2  =      1.5360 RADIANS                 PROPELLER-2
B1SP3  =      1.5360 RADIANS                 PROPELLER-3
B1SP4  =      1.5360 RADIANS                 PROPELLER-4

-----LPU ROLLER ANGLES WITH RESPECT TO THE HULL CENTER OF VOLUME REFERENCE AXES
GBANG1 = 0.          .3500E-01 0.          RADIANS
GBANG2 = 0.         -.3500E-01 0.          RADIANS
GBANG3 = 0.          .3500E-01 0.          RADIANS
GBANG4 = 0.         -.3500E-01 0.          RADIANS
```

```
----------PAYLOAD GEOMETRY INPUTS----------

-----BASIC PAYLOAD MEASUREMENTS
PAYLTH =    80.0000 FEET          PAYLOAD LENGTH
PAYDIA =    12.0000 FEET          PAYLOAD DEPTH
PAYVOL = 11520.0000 FT.**3        PAYLOAD DISPLACED VOLUME
PAYARA =   144.0000 FT.**2        PAYLOAD FRONT PROJECTED AREA
PAYIC  =         1                PAYLOAD CONFIGURATION ID #

-----FOUR ATTACH POINTS ON THE PAYLOAD WITH RESPECT TO THE PAYLOAD REFERENCE CENTER
RPICH1 =  40.00    0.00   -6.00 FEET
RPICH2 =  40.00    0.00   -6.00 FEET
RPICH3 = -40.00    0.00   -6.00 FEET
RPICH4 = -40.00    0.00   -6.00 FEET

-----FOUR ATTACH POINTS ON THE HULL WITH RESPECT TO THE HULL CENTER OF VOLUME
RATHF1 =  36.00    0.00   50.00 FEET
RATHF2 =  36.00    0.00   50.00 FEET
RATHF3 = -36.00    0.00   50.00 FEET
RATHF4 = -36.00    0.00   50.00 FEET

-----PAYLOAD CABLE LENGTHS
USLTH1 =  20.0000 FEET           CABLE 1
LSLTH2 =  20.0000 FEET           CABLE 2
USLTH3 =  18.0000 FEET           CABLE 3
LSLTH4 =  18.0000 FEET           CABLE 4
```

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----------MOORING POINT GEOMETRY----------

-----MOORING POINT ON MAST IN INERTIAL COORDINATES
MASTLC = 0.          0.          -.6511E+03  FEET

-----MOORING POINT ON HULL RELATIVE TO THE HULL CENTER OF VOLUME
RPCHFT =  .1200E+03 0.          0.          FEET

----------LANDING GEAR ATTACH POINTS AND SPRING CONSTANTS--------

-----LANDING GEAR ATTACH POINTS ON THE HULL
RATHG1 =  .3600E+02 -.4600E+02  .6200E+02  FEET
RATHG2 =  .3600E+02  .4600E+02  .6200E+02  FEET
RATHG3 = -.3600E+02 -.4600E+02  .6200E+02  FEET
RATHG4 = -.3600E+02  .4600E+02  .6200E+02  FEET

-----LANDING GEAR LENGTHS
LGRLN1 =  .3320E+01 FEET                   LANDING GEAR 1
LGRLN2 =  .3320E+01 FEET                   LANDING GEAR 2
LGRLN3 =  .3320E+01 FEET                   LANDING GEAR 3
LGRLN4 =  .3320E+01 FEET                   LANDING GEAR 4

-----LANDING GEAR SPRING CONSTANTS
GEARK1 =  .7770E+04 LB / FT
GEARK2 =  .7770E+04 LB / FT
GEARK3 =  .7770E+04 LB / FT
GEARK4 =  .7770E+04 LB / FT

-----LANDING GEAR FRAME STIFFNESS CONSTANTS
GFRMK1 =  .7770E+05 LB / FT
GFRMK2 =  .7770E+05 LB / FT
GFRMK3 =  .7770E+05 LB / FT
GFRMK4 =  .7770E+05 LB / FT

-----LANDING GEAR SPRING CAMPING CONSTANTS
GEARC1 =  .1554E+04 (LB * SEC) / FT
GEARC2 =  .1554E+04 (LB * SEC) / FT
GEARC3 =  .1554E+04 (LB * SEC) / FT
GEARC4 =  .1554E+04 (LB * SEC) / FT

-----LANDING GEAR FRICTION CONSTANTS
MUKG1  =  .8000E-01
MUKG2  =  .8000E-01
MUKG3  =  .8000E-01
MUKG4  =  .8000E-01
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-----PAYLOAD MASS AND MOMENT OF INERTIA INPUTS----------

-----PAYLOAD CENTER OF GRAVITY VECTOR WITH RESPECT TO THE PAYLOAD REFERENCE CENTER
RPAYCG =      0.0000     0.0000     0.0000  FEET

-----PASS AND PCPENT OF INERTIA OF THE PAYLOAD
PASPAY =  .1234E+04 SLUGS          MASS OF THE PAYLOAD
JPAYXX =  .2564E+05 SLUGS          MOMENT OF INERTIA ABOUT THE PAYLOAD X AXIS
JPAYYY =  .6784E+05 SLUGS          MOMENT OF INERTIA ABOUT THE PAYLOAD Y AXIS
JPAYZZ =  .6784E+05 SLUGS          MOMENT OF INERTIA ABOUT THE PAYLOAD Z AXIS
JPAYXZ =  0.        SLUGS          PRODUCT OF INERTIA WITH RESPECT TO THE XZ AXIS

----------PAYLOAD CABLE INPUTS----------

-----CABLE SPRING CONSTANTS
CAELK1 =  .6400E+05 (LBF/FT**2) / (FT**2)     CABLE 1
CAELK2 =  0.        (LBF/FT**2) / (FT**2)     CABLE 2
CAELK3 =  .6400E+05 (LBF/FT**2) / (FT**2)     CABLE 3
CAELK4 =  0.        (LBF/FT**2) / (FT**2)     CABLE 4

-----CABLE DAMPING CONSTANTS
CAELC1 =  .2400E+04 (LBF/FT**2) / (FT**2)     CABLE 1
CAELC2 =  0.        (LBF/FT**2) / (FT**2)     CABLE 2
CAELC3 =  .2400E+04 (LBF/FT**2) / (FT**2)     CABLE 3
CAELC4 =  0.        (LBF/FT**2) / (FT**2)     CABLE 4
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----------MASS AND MOMENT OF INERTIA INPUTS----------

-----HULL CENTER OF GRAVITY VECTOR WITH RESPECT TO HULL CENTER OF VOLUME REFERENCE AXES
RHLLCG = 0.          0.          .1663E+02  FEET

-----MASS AND MOMENT OF INERTIA OF HULL
MASHLL =  .2782E+04 SLUGS                    COMPLETE MASS OF HULL STRUCTURE
IHLLXX =  .6956E+07 SLUG*(FT.**2)            MOMENT OF INERTIA ABOUT CG X AXES
IHLLYY =  .1346E+08 SLUG*(FT.**2)            MOMENT OF INERTIA ABOUT CG Y AXES
IHLLZZ =  .1329E+08 SLUG*(FT.**2)            MOMENT OF INERTIA ABOUT CG Z AXES
IHLLXZ = 0.         SLUG*(FT.**2)            PRODUCT OF INERTIA WRT THE CG XZ AXES

-----FOUR VECTORS LOCATING EACH LPU'S CG WITH RESPECT TO ITS FUSELAGE REFERENCE AXES
RCGLF1 = 0.          0.          0.          FEET
RCGLF2 = 0.          0.          0.          FEET
RCGLF3 = 0.          0.          0.          FEET
RCGLF4 = 0.          0.          0.          FEET

-----MASS AND MOMENT OF INERTIA OF LPU-1
MASLF1 =  .2795E+03 SLUGS                    MASS OF LPU-1
ILF1XX =  .8576E+04 SLUG*(FT.**2)            MOMENT OF INERTIA ABOUT CG X AXES
ILF1YY =  .4066E+05 SLUG*(FT.**2)            MOMENT OF INERTIA ABOUT CG Y AXES
ILF1ZZ =  .3946E+05 SLUG*(FT.**2)            MOMENT OF INERTIA ABOUT CG Z AXES
ILF1XZ = 0.         SLUG*(FT.**2)            PRODUCT OF INERTIA WRT THE CG XZ AXES

-----MASS AND MOMENT OF INERTIA OF LPU-2
MASLF2 =  .2795E+03 SLUGS                    MASS OF LPU-2
ILF2XX =  .8576E+04 SLUG*(FT.**2)            MOMENT OF INERTIA ABOUT CG X AXES
ILF2YY =  .4066E+05 SLUG*(FT.**2)            MOMENT OF INERTIA ABOUT CG Y AXES
ILF2ZZ =  .3946E+05 SLUG*(FT.**2)            MOMENT OF INERTIA ABOUT CG Z AXES
ILF2XZ = 0.         SLUG*(FT.**2)            PRODUCT OF INERTIA WRT THE CG XZ AXES

-----MASS AND MOMENT OF INERTIA OF LPU-3
MASLF3 =  .2795E+03 SLUGS                    MASS OF LPU-3
ILF3XX =  .8576E+04 SLUG*(FT.**2)            MOMENT OF INERTIA ABOUT CG X AXES
ILF3YY =  .4066E+05 SLUG*(FT.**2)            MOMENT OF INERTIA ABOUT CG Y AXES
ILF3ZZ =  .3946E+05 SLUG*(FT.**2)            MOMENT OF INERTIA ABOUT CG Z AXES
ILF3XZ = 0.         SLUG*(FT.**2)            PRODUCT OF INERTIA WRT THE CG XZ AXES

-----MASS AND MOMENT OF INERTIA OF LPU-4
MASLF4 =  .2795E+03 SLUGS                    MASS OF LPU-4
ILF4XX =  .8576E+04 SLUG*(FT.**2)            MOMENT OF INERTIA ABOUT CG X AXES
ILF4YY =  .4066E+05 SLUG*(FT.**2)            MOMENT OF INERTIA ABOUT CG Y AXES
ILF4ZZ =  .3946E+05 SLUG*(FT.**2)            MOMENT OF INERTIA ABOUT CG Z AXES
ILF4XZ = 0.         SLUG*(FT.**2)            PRODUCT OF INERTIA WRT THE CG XZ AXES

-----ROTOR LOCK NUMBER
LOCNR1 =    15.0000                          ROTOR 1
LOCNR2 =    15.0000                          ROTOR 2
LOCNR3 =    15.0000                          ROTOR 3
LOCNR4 =    15.0000                          ROTOR 4
```

---EXHAUST THRUST INPUTS---

-----EXHAUST JET FORCES

JETHS1 = .1000E+03 LBS.		LPU 1
JETHS2 = .1000E+03 LBS.		LPU 2
JETHS3 = .1000E+03 LBS.		LPU 3
JETHS4 = .1000E+03 LBS.		LPU 4

-----LOCATION OF THE EXHAUST NOZZLES WITH RESPECT TO THE FUSELAGE REFERENCE CENTERS

REXLC1 = -.1600E+02	0.	-.3100E+01	FEET	LPU 1
REXLC2 = -.1600E+02	0.	-.3000E+01	FEET	LPU 2
REXLC3 = -.1600E+02	0.	-.3000E+01	FEET	LPU 3
REXLC4 = -.1600E+02	0.	-.3000E+01	FEET	LPU 4

-----ANGULAR ORIENTATIONS OF THE EXHAUST NOZZLES WITH RESPECT TO THE FUSELAGE REFERENCE CENTERS

A1SE1 = 0.	RADIANS		LPU 1
B1SE1 = .1400E+01	RADIANS		LPU 1
A1SE2 = 0.	RADIANS		LPU 2
B1SE2 = .1400E+01	RADIANS		LPU 2
A1SE3 = 0.	RADIANS		LPU 3
B1SE3 = .1400E+01	RADIANS		LPU 3
A1SE4 = 0.	RADIANS		LPU 4
B1SE4 = .1400E+01	RADIANS		LPU 4

```
-----------------------------------------------FAYLCAD AERODYNAMIC PARAMETERS INPUT----

-----FAYLCAC X, Y AND Z FORCE DERIVATIVES WITH RESPECT TO:
XLLAEF = -.2654E+00 LE*(S**2)/(FT**2)          L * ABS(U)
YVVAEF = -.2254E+01 LE*(S**2)/(FT**2)          V * ABS(V)
ZWWAEF = -.2254E+01 LE*(S**2)/(FT**2)          W * ABS(W)

-----FAYLCAC TWING PCPENT DERIVATIVE WITH RESPECT TO:
NLVF   = -.2000E+02 LE*(S**2)/FT                U * V

LPPAEF = 0.          FT*LB*(S**2)/(RAD**2)      P * ABS(P)
MQQAEF = -.1500E+05 FT*LB*(S**2)/(RAD**2)      Q * ABS(Q)
NRRAEF = -.2000E+05 FT*LB*(S**2)/(RAD**2)      R * ABS(R)
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-------------------------------------------------LPU AERODYNAMIC PARAMETERS INPUT--------------------
-----FOUR VECTORS LOCATING FUSELAGE AERODYNAMIC CENTER WITH RESPECT TO LPU FUSELAGE REFERENCE AXES
$ACLP1 = 0.          0.          0.          FEET
$ACLP2 = 0.          0.          0.          FEET
$ACLP3 = 0.          0.          0.          FEET
$ACLP4 = 0.          0.          0.          FEET

-----ROTOR BLADE LIFT CURVE SLOPE AND DRAG COEFFICIENTS

LCSR1  =     5.7300 1/RAD.                  ROTOR 1
CLTR1A =      .0087 1/RAD.
CLTR1B =     -.0218 1/RAD.
CLTR1C =      .4000 1/RAD.

LCSR2  =     5.7300 1/RAD.                  ROTOR 2
CLTR2A =      .0087 1/RAD.
CLTR2B =     -.0218 1/RAD.
CLTR2C =      .4000 1/RAD.

LCSR3  =     5.7300 1/RAD.                  ROTOR 3
CLTR3A =      .0087 1/RAD.
CLTR3B =     -.0218 1/RAD.
CLTR3C =      .4000 1/RAD.

LCSR4  =     5.7300 1/RAD.                  ROTOR 4
CLTR4A =      .0087 1/RAD.
CLTR4B =     -.0218 1/RAD.
CLTR4C =      .4000 1/RAD.

-----PROPELLER BLADE LIFT CURVE SLOPE AND DRAG COEFFICIENTS

LCSP1  =     5.7300 1/RAD.                  PROPELLER 1
CLTP1A =      .0087 1/RAD.
CLTP1B =     -.0218 1/RAD.
CLTP1C =      .4000 1/RAD.

LCSP2  =     5.7300 1/RAD.                  PROPELLER 2
CLTP2A =      .0087 1/RAD.
CLTP2B =     -.0218 1/RAD.
CLTP2C =      .4000 1/RAD.

LCSP3  =     5.7300 1/RAD.                  PROPELLER 3
CLTP3A =      .0087 1/RAD.
CLTP3B =     -.0218 1/RAD.
CLTP3C =      .4000 1/RAD.

LCSP4  =     5.7300 1/RAD.                  PROPELLER 4
CLTP4A =      .0087 1/RAD.
CLTP4B =     -.0218 1/RAD.
CLTP4C =      .4000 1/RAD.
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----------HULL AERODYNAMIC PARAMETERS INPUT----------

-----HULL ACCELERATION DERIVATIVES
XUDOT  = -.6634E+03 LB*(S**2)/FT          X FORCE DERIVATIVE WITH RESPECT TO LONGITUDINAL ACCELERATION
YVDOT  = -.2600E+04 LB*(S**2)/FT          Y FORCE DERIVATIVE WITH RESPECT TO LATERAL ACCELERATION
ZWDOT  = -.2600E+04 LB*(S**2)/FT          Z FORCE DERIVATIVE WITH RESPECT TO DOWNWARD ACCELERATION
LPDOT  =  0.        FT*LB*(S**2)/RAD      ROLLING MOMENT DERIVATIVE WITH RESPECT TO ROLLING ACCELERATION
MQDOT  = -.3612E+07 FT*LB*(S**2)/RAD      PITCHING MOMENT DERIVATIVE WITH RESPECT TO PITCHING ACCELERATION
NRDOT  = -.3612E+07 FT*LB*(S**2)/RAD      YAWING MOMENT DERIVATIVE WITH RESPECT TO YAW ACCELERATION

-----TAIL ACCELERATION DERIVATIVES
YVDOT1 = -.4954E+03 LB*(S**2)/FT          Y FORCE DERIVATIVE WITH RESPECT TO LATERAL ACCELERATION
ZWDOT1 = -.6954E+03 LB*(S**2)/FT          Z FORCE DERIVATIVE WITH RESPECT TO DOWNWARD ACCELERATION
LVDOT1 = -.9787E+04 LB*(S**2)             ROLLING MOMENT DERIVATIVE WITH RESPECT TO LATERAL ACCELERATION
LPDOT1 = -.3366E+06 FT*LB*(S**2)/RAD      ROLLING MOMENT DERIVATIVE WITH RESPECT TO ROLLING ACCELERATION
MQDOT1 = -.3891E+04 FT*LB*(S**2)/RAD      PITCHING MOMENT DERIVATIVE WITH RESPECT TO PITCHING ACCELERATION
NRDOT1 = -.3891E+04 FT*LB*(S**2)/RAD      YAWING MOMENT DERIVATIVE WITH RESPECT TO YAW ACCELERATION

-----HULL X FORCE DERIVATIVES WITH RESPECT TO:
XUABS  = -.4136E+00 LB*(S**2)/(FT**2)     U * ABS(U)
XQW    = -.2600E+04 LB*(S**2)/(RAD*FT)    Q * W
XRV    =  .2600E+04 LB*(S**2)/(RAD*FT)    R * V

-----HULL Y FORCE DERIVATIVES WITH RESPECT TO:
YVABS  = -.3604E+02 LB*(S**2)/(FT**2)     V * ABS(V)
YRABS  =  0.        LB*(S**2)/(RAD*FT)    R * ABS(R)
YPW    =  .2600E+04 LB*(S**2)/(RAD*FT)    P * W
YRU    = -.6634E+03 LB*(S**2)/(RAD*FT)    R * U
YRVABS =  0.        LB*(S**2)/(RAD*FT)    R * ABS(V)

-----HULL Z FORCE DERIVATIVES WITH RESPECT TO:
ZWABS  = -.2604E+02 LB*(S**2)/(FT**2)     W * ABS(W)
ZQABS  =  0.        LB*(S**2)/(RAD**2)    Q * ABS(Q)
ZPV    = -.2600E+04 LB*(S**2)/(RAD*FT)    P * V
ZQU    =  .6634E+03 LB*(S**2)/(RAD*FT)    Q * U
ZQWABS =  0.        LB*(S**2)/(RAD*FT)    Q * ABS(W)

-----HULL ROLLING MOMENT DERIVATIVES WITH RESPECT TO:
LPABS  = -.1314E+05 FT*LB*(S**2)/(RAD**2) P * ABS(P)
LPLABS =  0.        FT*LB*(S**2)/(RAD**2) P * ABS(L)
LVW    =  0.        LB*(S**2)/FT          V * W
LQBR   = -.3612E+07 FT*LB*(S**2)/(RAD**2) QB * R
LRBQ   =  .3612E+07 FT*LB*(S**2)/(RAD**2) RB * Q

-----HULL PITCHING MOMENT DERIVATIVES WITH RESPECT TO:
MQABS  = -.9220E+07 FT*LB*(S**2)/(RAD**2) Q * ABS(Q)
MUW    =  .1452E+04 LB*(S**2)/FT          U * W
MRBP   =  0.        FT*LB*(S**2)/(RAD**2) RB * P
MPBR   =  .3612E+07 FT*LB*(S**2)/(RAD**2) PB * R
MQWABS = -.2317E+06 LB*(S**2)/RAD         Q * ABS(W)

-----HULL YAWING MOMENT DERIVATIVE WITH RESPECT TO:
NRABS  = -.8220E+07 FT*LB*(S**2)/(RAD**2) R * ABS(R)
NUV    = -.1452E+04 LB*(S**2)/FT          U * V
NPBQ   = -.3612E+07 FT*LB*(S**2)/(RAD**2) PB * Q
NQBP   =  0.        FT*LB*(S**2)/(RAD**2) QB * P
NRVABS = -.2317E+06 LB*(S**2)/RAD         R * ABS(V)
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-----TAIL X FORCE DERIVATIVES WITH RESPECT TO:
XLLAET = -.1379E+00 LB*(S**2)/(FT**2)                U * ABS(L)

-----TAIL Y FORCE DERIVATIVES WITH RESPECT TO:
YVVAET = -.2446E+01 LB*(S**2)/(FT**2)                V * ABS(V)
YPPAET = -.3283E+04 LB*(S**2)/(RAD**2)               P * ABS(P)
YAFVST = -.1467E+01 LB*(S**2)/(RAD*(FT**2))          ALPHA-P * (VPT**2)
YBVSQT = -.2072E+01 LB*(S**2)/(RAD*(FT**2))          BETA * (VXY**2)
YBSQVT = -.1734E+01 LB*(S**2)/((RAD**2)*(FT**2))     BETA*ABS(BETA)*(VXY)**2)
YAFSVS = -.2939E+01 LB*(S**2)/((RAD**2)*(FT**2))     ALPHA1P*ABS(ALPHA1P)*(VPT**2)

-----TAIL Z FORCE DERIVATIVES WITH RESPECT TO:
ZWWAET = -.2440E+01 LB*(S**2)/(FT**2)                W * ABS(W)
ZAVSQT = -.4141E+01 LB*(S**2)/(RAD*(FT**2))          ALPHA * VXZ**2
ZASVST = -.4806E+01 LB*(S**2)/((RAD**2)*(FT**2))     ALPHA*ABS(ALPHA)*(VXZ**2)

-----TAIL ROLL MOMENT DERIVATIVES WITH RESPECT TO:
LVVAET = -.4395E+01 LB*(S**2)/FT                     V * ABS(V)
LPPAET = -.1767E+06 LB*(S**2)/(RAD*FT)               P * ABS(P)
LAFVST = -.7746E+02 LB*(S**2)/(RAD*FT)               ALPHA-P * VPT**2
LBVSQT = -.3336E+01 LB*(S**2)/(RAD*FT)               BETA * VXY**2
LBAVST = -.1526E+01 LB*(S**2)/((RAD**2)*FT)          BETA*ALPHA*(VXY**2)
LAFSVS = -.1551E+03 LB*(S**2)/((RAD**2)*FT)          ALPHA1P*ABS(ALPHA1P)*(VPT**2)

-----TAIL LOCATION SCALE FACTORS
LAPTXC =       .7600                                 X-AXIS CORRECTION FOR PITCHING MOMENTS
LAPTXB =       .7000                                 X-AXIS CORRECTION FOR YAWING MOMENTS
LAPTZC =      1.6000                                 Z-AXIS CORRECTION FOR PITCHING MOMENTS

-----STALL PARAMETERS
AL1T   =   .5236E+00 RADIANS                         LONGITUDINAL TAIL STALLING PARAMETERS
AL2T   =   .6981E+00 RADIANS
BETA1T =   .5236E+00 RADIANS                         LATERAL TAIL STALL PARAMETERS
BETA2T =   .6981E+00 RADIANS
ALF1T  =   .5236E+00 RADIANS                         TAIL ROLLING STALL PARAMETERS
ALF2T  =   .6981E+00 RADIANS

-----TAIL SURFACE EFFECTIVENESS PARAMETERS
TALA   =   .5000E+00 (SEC**2) / (FT**2)              AILERON
TALE   =   .5000E+00 (SEC**2) / (FT**2)              ELEVATOR
TALR   =   .5000E+00 (SEC**2) / (FT**2)              RUDDER
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----------INTERFERENCE CONSTANTS ON ROTOR------

-----SHADOW CONSTANTS ROTOR 1
BWK1R1 =   .1745E+01 RADIANS          BETA WAKE ANGLE 1
BWK2R1 =   .2967E+01 RADIANS          BETA WAKE ANGLE 2
MXDCR1 =   .8500E+00                  BETA WAKE MAXIMUM DEFECT
LWK1R1 =   .3316E+01 RADIANS          LAMBDA WAKE ANGLE 1
LWK2R1 =   .2863E+01 RADIANS          LAMBDA WAKE ANGLE 2
MXLDR1 =   .8500E+00                  LAMBDA WAKE MAXIMUM DEFECT

-----SHADOW CONSTANTS ROTOR 2
BWK1R2 =   .3316E+01 RADIANS          BETA WAKE ANGLE 1
BWK2R2 =   .4538E+01 RADIANS          BETA WAKE ANGLE 2
MXDCR2 =   .8500E+00                  BETA WAKE MAXIMUM DEFECT
LWK1R2 =   .3403E+01 RADIANS          LAMBDA WAKE ANGLE 1
LWK2R2 =   .4974E+01 RADIANS          LAMBDA WAKE ANGLE 2
MXLDR2 =   .8500E+00                  LAMBDA WAKE MAXIMUM DEFECT

-----SHADOW CONSTANTS ROTOR 3
BWK1R3 =   .1745E+00 RADIANS          BETA WAKE ANGLE 1
BWK2R3 =   .1396E+01 RADIANS          BETA WAKE ANGLE 2
MXDCR3 =   .8500E+00                  BETA WAKE MAXIMUM DEFECT
LWK1R3 =   .3316E+01 RADIANS          LAMBDA WAKE ANGLE 1
LWK2R3 =   .2863E+01 RADIANS          LAMBDA WAKE ANGLE 2
MXLDR3 =   .8500E+00                  LAMBDA WAKE MAXIMUM DEFECT

-----SHADOW CONSTANTS ROTOR 4
BWK1R4 =   .4887E+01 RADIANS          BETA WAKE ANGLE 1
BWK2R4 =   .6109E+01 RADIANS          BETA WAKE ANGLE 2
MXDCR4 =   .8500E+00                  BETA WAKE MAXIMUM DEFECT
LWK1R4 =   .3403E+01 RADIANS          LAMBDA WAKE ANGLE 1
LWK2R4 =   .4974E+01 RADIANS          LAMBDA WAKE ANGLE 2
MXLDR4 =   .8500E+00                  LAMBDA WAKE MAXIMUM DEFECT

-----HUB DRAG ROTOR CONSTANTS
KDRA1  =   .1200E+02 LB / (FT**2)     ROTOR 1  A
KDRB1  =   .3300E-01                  ROTOR 1  B
KDRA2  =   .1200E+02 LB / (FT**2)     ROTOR 2  A
KDRB2  =   .3300E-01                  ROTOR 2  B
KDRA3  =   .1200E+02 LB / (FT**2)     ROTOR 3  A
KDRB3  =   .3300E-01                  ROTOR 3  B
KDRA4  =   .1200E+02 LB / (FT**2)     ROTOR 4  A
KDRB4  =   .3300E-01                  ROTOR 4  B

-----PROFILE DRAG ROTOR CONSTANTS
KPR1   = -.2600E+01
KPR2   = -.2600E+01
KPR3   = -.2600E+01
KPR4   = -.2600E+01
```

```
----------------------------------------------INTERFERENCE CONSTANTS ON PROPELLER----

-----SHADOW CONSTANTS PROPELLER 1
BWK1P1 =  .1745E+01 RADIANS          BETA WAKE ANGLE 1
BWK2P1 =  .2967E+01 RADIANS          BETA WAKE ANGLE 2
MXBCP1 =  .85..E+00                  BETA WAKE MAXIMUM DEFECT
LWK1P1 =  .1310E+01 RADIANS          LAMBDA WAKE ANGLE 1
LWK2P1 =  .2..E+01 RADIANS           LAMBDA WAKE ANGLE 2
MXLCP1 =  .85..E+00                  LAMBDA WAKE MAXIMUM DEFECT

-----SHADOW CONSTANTS PROPELLER 2
BWK1P2 =  .331.E+01 RADIANS          BETA WAKE ANGLE 1
BWK2P2 =  .45..E+01 RADIANS          BETA WAKE ANGLE 2
MXBCP2 =  .85..E+00                  BETA WAKE MAXIMUM DEFECT
LWK1P2 =  .3403E+01 RADIANS          LAMBDA WAKE ANGLE 1
LWK2P2 =  .4974E+01 RADIANS          LAMBDA WAKE ANGLE 2
MXLCP2 =  .85..E+00                  LAMBDA WAKE MAXIMUM DEFECT

-----SHADOW CONSTANTS PROPELLER 3
BWK1P3 =  .1745E+00 RADIANS          BETA WAKE ANGLE 1
BWK2P3 =  .1390E+01 RADIANS          BETA WAKE ANGLE 2
MXBCP3 =  .85..E+00                  BETA WAKE MAXIMUM DEFECT
LWK1P3 =  .1310E+01 RADIANS          LAMBDA WAKE ANGLE 1
LWK2P3 =  .2..E+01 RADIANS           LAMBDA WAKE ANGLE 2
MXLCP3 =  .85..E+00                  LAMBDA WAKE MAXIMUM DEFECT

-----SHADOW CONSTANTS PROPELLER 4
BWK1P4 =  .4..7E+01 RADIANS          BETA WAKE ANGLE 1
BWK2P4 =  .61..E+01 RADIANS          BETA WAKE ANGLE 2
MXBCP4 =  .85..E+00                  BETA WAKE MAXIMUM DEFECT
LWK1P4 =  .3403E+01 RADIANS          LAMBDA WAKE ANGLE 1
LWK2P4 =  .4974E+01 RADIANS          LAMBDA WAKE ANGLE 2
MXLCP4 =  .85..E+00                  LAMBDA WAKE MAXIMUM DEFECT

-----PLLL CN PROPELLER CONSTANTS
KPFA1  =  .12..E+02 LB / (FT**2)     PROPELLER 1  A
KPFB1  =  .3335E-01                  PROPELLER 1  B
KPFA2  =  .1200E+02 LB / (FT**2)     PROPELLER 2  A
KPFB2  =  .33..E-01                  PROPELLER 2  B
KPFA3  =  .12..E+02 LB / (FT**2)     PROPELLER 3  A
KPFB3  =  .3330E-01                  PROPELLER 3  B
KPFA4  =  .12..E+02 LB / (FT**2)     PROPELLER 4  A
KPFB4  =  .3330E-01                  PROPELLER 4  B

-----ROTOR CN PROPELLER CONSTANTS
KRF1   =  .16..E+01                  LPU 1
KRF2   =  .16..E+01                  LPL 2
KRF3   =  .16..E+01                  LPU 3
KRF4   =  .16..E+01                  LPL 4

-----GROUND CN PROPELLER CONSTANTS
KGF1   = -.20..E+01                  LPU 1
KGF2   = -.20..E+01                  LPL 2
KGF3   = -.20..E+01                  LPU 3
KGF4   = -.20..E+01                  LPL 4
```

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-----------------------------------------------INTERFERENCE CONSTANTS ON FUSELAGE-----

-----SHADOW CONSTANTS FUSELAGE 1
BWK1F1 =   .1745E+01 RADIANS                    BETA WAKE ANGLE 1
BWK2F1 =   .2967E+01 RADIANS                    BETA WAKE ANGLE 2
MXBDF1 =   .8500E+00                            BETA WAKE MAXIMUM DEFECT
LWK1F1 =   .1310E+01 RADIANS                    LAMBDA WAKE ANGLE 1
LWK2F1 =   .2356E+01 RADIANS                    LAMBDA WAKE ANGLE 2
MXLDF1 =   .8500E+00                            LAMBDA WAKE MAXIMUM DEFECT

-----SHADOW CONSTANTS FUSELAGE 2
BWK1F2 =   .3316E+01 RADIANS                    BETA WAKE ANGLE 1
BWK2F2 =   .4538E+01 RADIANS                    BETA WAKE ANGLE 2
MXBDF2 =   .8500E+00                            BETA WAKE MAXIMUM DEFECT
LWK1F2 =   .3463E+01 RADIANS                    LAMBDA WAKE ANGLE 1
LWK2F2 =   .4974E+01 RADIANS                    LAMBDA WAKE ANGLE 2
MXLDF2 =   .8500E+00                            LAMBDA WAKE MAXIMUM DEFECT

-----SHADOW CONSTANTS FUSELAGE 3
BWK1F3 =   .1745E+00 RADIANS                    BETA WAKE ANGLE 1
BWK2F3 =   .1396E+01 RADIANS                    BETA WAKE ANGLE 2
MXBDF3 =   .8500E+00                            BETA WAKE MAXIMUM DEFECT
LWK1F3 =   .1310E+01 RADIANS                    LAMBDA WAKE ANGLE 1
LWK2F3 =   .2356E+01 RADIANS                    LAMBDA WAKE ANGLE 2
MXLDF3 =   .8500E+00                            LAMBDA WAKE MAXIMUM DEFECT

-----SHADOW CONSTANTS FUSELAGE 4
BWK1F4 =   .4887E+01 RADIANS                    BETA WAKE ANGLE 1
BWK2F4 =   .6109E+01 RADIANS                    BETA WAKE ANGLE 2
MXBDF4 =   .8500E+00                            BETA WAKE MAXIMUM DEFECT
LWK1F4 =   .3463E+01 RADIANS                    LAMBDA WAKE ANGLE 1
LWK2F4 =   .4974E+01 RADIANS                    LAMBDA WAKE ANGLE 2
MXLDF4 =   .8500E+00                            LAMBDA WAKE MAXIMUM DEFECT

-----ACTUAL CN FUSELAGE CONSTANTS
KRF1   =   .1600E+01                            FUSELAGE 1
KRF2   =   .1600E+01                            FUSELAGE 2
KRF3   =   .1600E+01                            FUSELAGE 3
KRF4   =   .1600E+01                            FUSELAGE 4

-----PROPELLER CN FUSELAGE CONSTANTS
KPF1   =   .1600E+01
KPF2   =   .1600E+01
KPF3   =   .1600E+01
KPF4   =   .1600E+01
```

----------INTERFERENCE CONSTANTS CA MLLL-----

-----CHOLAC CA MLLL CONSTANTS

KCMA	= -.41[illegible]E+01	A CONSTANT
KCMB	= -.41[illegible]E+01	B CONSTANT

-----ROTOR 1 CA MLLL

KAMA1	= 0.	SEC / FT
KAMB1	= .1[illegible]E-03	(SEC**2) / (FT**2)
KAMC1	= .2[illegible]E+00	
KAMC1	= -.4[illegible]E-01	
KAME1	= .33[illegible]E-01	

-----ROTOR 2 CA MLLL

KAMA2	= 0.	SEC / FT
KAMB2	= .13[illegible]E-03	(SEC**2) / (FT**2)
KAMC2	= .2[illegible]E+00	
KAMC2	= .43[illegible]E-01	
KAME2	= .33[illegible]E-01	

-----ROTOR 3 CA MLLL

KAMA3	= 0.	SEC / FT
KAMB3	= .13[illegible]E-03	(SEC**2) / (FT**2)
KAMC3	= -.2[illegible]E+00	
KAMC3	= -.43[illegible]E-01	
KAME3	= .33[illegible]E-01	

-----ROTOR 4 CA MLLL

KAMA4	= 0.	SEC / FT
KAMB4	= .1[illegible]E-03	(SEC**2) / (FT**2)
KAMC4	= -.2[illegible]E+00	
KAMC4	= .43[illegible]E-01	
KAME4	= .33[illegible]E-01	

-----PROPELLER 1 CA MLLL

KPMA1	= 0.	SEC / FT
KPME1	= .539[illegible]E-05	(SEC**2) / (FT**2)
KPMC1	= .1[illegible]E-01	
KPMC1	= -.23[illegible]E-02	
KPME1	= .183[illegible]E-02	

-----PROPELLER 2 CA MLLL

KPMA2	= 0.	SEC / FT
KPME2	= .539[illegible]E-05	(SEC**2) / (FT**2)
KPMC2	= .1[illegible]E-01	
KPMC2	= -.23[illegible]E-02	
KPME2	= .183[illegible]E-02	

-----PROPELLER 3 CA MLLL

KPMA3	= 0.	SEC / FT
KPMB3	= .539[illegible]E-05	(SEC**2) / (FT**2)
KPMC3	= -.1[illegible]E-01	
KPMC3	= -.23[illegible]E-02	
KPME3	= .183[illegible]E-02	

-----PROPELLER 4 CA MLLL

KPMA4	= 0.	SEC / FT
KPMB4	= .539[illegible]E-05	(SEC**2) / (FT**2)
KPMC4	= -.1[illegible]E-01	
KPMC4	= -.23[illegible]E-02	
KPME4	= .183[illegible]E-02	

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----------INTERFERENCE CONSTANTS ON TAIL-----

- ---ACTOR 1 ON TAIL CONSTANTS
KF1A1 =  .14[illegible]E-01
KF1B1 = -.5[illegible]E-02
KF1C1 =  .51[illegible]E-02

-----ACTOR 2 ON TAIL CONSTANTS
KF1A2 =  .14[illegible]E-01
KF1B2 =  .5[illegible]E-02
KF1C2 =  .51[illegible]E-02

-----ACTOR 3 ON TAIL CONSTANTS
KF1A3 =  .3[illegible]E-01
KF1B3 = -.12[illegible]E-01
KF1C3 =  .11[illegible]E-01

-----ACTOR 4 ON TAIL CONSTANTS
KF1A4 =  .3[illegible]E-01
KF1B4 =  .12[illegible]E-01
KF1C4 =  .11[illegible]E-01

-----PROPELLER 1 ON TAIL CONSTANTS
KF1A1 =  .76[illegible]E-03
KF1B1 = -.3[illegible]E-03
KF1C1 =  .275[illegible]E-03

-----PROPELLER 2 ON TAIL CONSTANTS
KF1A2 =  .76[illegible]E-03
KF1B2 =  .3[illegible]E-03
KF1C2 =  .2750[illegible]E-03

-----PROPELLER 3 ON TAIL CONSTANTS
KF1A3 =  .1640[illegible]E-02
KF1B3 = -.66[illegible]E-03
KF1C3 =  .59[illegible]E-03

-----PROPELLER 4 ON TAIL CONSTANTS
KF1A4 =  .1640[illegible]E-02
KF1B4 =  .66[illegible]E-03
KF1C4 =  .593[illegible]E-03

-----GROUND ON TAIL CONSTANTS
KG1A  = -.5177[illegible]E02 (SEC**2) / (FT**2)
KG1B  =  .16[illegible]E02 (SEC**2) / (FT**2)
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----------ROTOR AND PROPELLER SPIN RATES----------

OMEGA1 =   23.2500 RAD./SEC.     ROTOR 1 SPIN RATE
OMEGA2 =   23.2500 RAD./SEC.     ROTOR 2 SPIN RATE
OMEGA3 =   23.2500 RAD./SEC.     ROTOR 3 SPIN RATE
OMEGA4 =   23.2500 RAD./SEC.     ROTOR 4 SPIN RATE

OMGPF1 =  125.6000 RAD./SEC.     PROPELLER 1 SPIN RATE
OMGPF2 =  125.6000 RAD./SEC.     PROPELLER 2 SPIN RATE
OMGPF3 =  125.6000 RAD./SEC.     PROPELLER 3 SPIN RATE
OMGPF4 =  125.6000 RAD./SEC.     PROPELLER 4 SPIN RATE

----------MECHANICAL FLIGHT CONTROL SYSTEM CONSTANTS----------

THCMPX =     .5000 RADIANS       MAXIMUM ROTOR COLLECTIVE PITCH ANGLE
AISMPX =     .5000 RADIANS       MAXIMUM ROTOR LATERAL CYCLIC PITCH ANGLE
ELSMPX =     .5000 RADIANS       MAXIMUM ROTOR LONGITUDINAL CYCLIC PITCH ANGLE
THPMPX =     .5000 RADIANS       MAXIMUM PROPELLER COLLECTIVE PITCH ANGLE
CLAPX  =  .1000E+01 RADIANS      MAXIMUM TAIL AILERON DEFLECTION
DLELPX =  .1000E+01 RADIANS      MAXIMUM TAIL ELEVATOR DEFLECTION
CLRCPX =  .1000E+01 RADIANS      MAXIMUM TAIL RUDDER DEFLECTION
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-----------------------------------------------INERTIAL VEHICLE STATE INPUTS-----------------------------------------------

-----FULL CG REFERENCE AXES VELOCITY VECTOR WITH RESPECT TO INERTIAL SPACE
VFLL   =     44.00.     -5.00.      0.00 FT./SEC.

-----FULL CG REFERENCE AXES INERTIAL POSITION IN INERTIAL COORDINATES
FLLPOS =      0.00.      0.00. -1000.00 FEET

-----EULER ANGLE RATES OF FULL CG REFERENCE AXES WITH RESPECT TO AN INERTIAL FRAME: PHIDOT, THECDT PSIDOT
HLLELR =      0.00.      0.00.      .05 RAD./SEC.

-----EULER ANGLES OF THE FULL CG REFERENCE AXES WITH RESPECT TO AN INERTIAL FRAME: PHI, THETA, PSI
HLLELL =       .10.      0.00.      0.00 RADIANS

-----------------------------------------------ATMOSPHERIC PARAMETER INPUTS-----------------------------------------------

AIRDEN =  .2378E-02                      SLUG / (FT**3)      REFERENCE ATMOSPHERIC DENSITY
DENRAT =     1.0000                                          DENSITY RATIO
GRAV   =  .3217E+02                      FT./(SEC.**2)       EARTHS GRAVITATIONAL ACCELERATION
WWIND  =      0.00.      0.00.      0.00  FT./SEC.            STEADY WIND VECTOR IN INERTIAL FRAME COORDINATES

-----------------------------------------------STABILITY DERIVATIVE FLAGS-----------------------------------------------

DERVFL = 1                               STABILITY DERIVATIVES TO BE CALCULATED
AMATFL = 1                               A MATRIX
BMATFL = 1                               B MATRIX
BPRIMFL = 1                              B PRIME MATRIX
CMATFL = 1                               C MATRIX
CFMTFL = 1                               ALL CONSTRAINT FORCE (AUXILIARY) MATRICES

  PAYLOAD TRIM CASE NUMBER    1

  THIS PAYLOAD TRIM CONVERGED SATISFACTORILY

  TRIM ALGORITHM CONTROL
  ITERATIONS =   39      RESTARTS =    0      CONV. CRIT. =  .5112E-03
  PRPVLCTX =   -.3e32  PRPVLCTY =    .8303  PRPVLCTZ =  58.2646  PAY PHI =    .0668  PAY THETA =   -.0267  PAY PSI =   -.00
  POSITION LIMITS AND SINGULAR MATRICES FLAGGED DURING PAYLOAD TRIP.  HRPLFL =    1    PSNGMT =    0
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PAYLOAD VARIABLES AT TIME --     -1.00

          L              V              R              P              Q              R              X              Y              Z            PHI
PAYLOAD  44.222      -5.0000       -1.2431       .13334E-02  .33340E-02  .49871E-01  -.36324       .03032       58.265       .66770E-01

        THETA          PSI         PAXCGG         PAYCGG         PAZCGG       VPAYRL#X       VPAYRL#Y       VPAYRL#Z       PAYIPC#X       PAYIPO#Y
PAYLOAD -.26671E-01  -.21863E-03   .77550E-02   .66601E-01  -.47942E-02   .24953        -.18071E-01   .18132E-02  -.36324       -4.9906

       PAYIPO#Z       VPGLST#X       VPGUST#Y       VPGLST#Z       OPGLST#X       OPGUST#Y       OPGUST#Z       RVPAYC#X       RVPAYC#Y       RVPAYC#Z
PAYLOAD -941.94        0.             0.             0.             0.             0.             0.            44.222        -5.0000       -1.3431

       RCPAYC#X       RCPAYC#Y       RCPAYC#Z       STATPF#X       STATPF#Y       STATPF#Z       STATPM#X       STATPM#Y       STATPM#Z       DYNAPM#X
PAYLOAD  .13334E-02   .33340E-02   .49871E-01  -556.13         76.183         20.142         0.             0.            4493.0         0.

       DYNAPM#Y       DYNAPM#Z       RPWFOR#X       RPWFOR#Y       RPWFOR#Z       RPWMOM#X       RPWMOM#Y       RPWMOM#Z       PYAFOR#X       PYAFOR#Y
PAYLOAD -.11121       -24.871        -556.13         76.183         20.142         0.            -.11121        4466.1        -556.13         76.183

       PYAFOR#Z       PYAMOM#X       PYAMOM#Y       PYAMOM#Z       PCELFO#X       PCBLFO#Y       PCBLFO#Z       PCBLMC#X       PCBLMC#Y       PCBLMO#Z
PAYLOAD  20.142        0.            -.11121        4466.1        -199.18       -.22113E-05  -40109.       -.13268E-04  -42.588       -4465.2

          CBLTH          CLRAT          CBLTA         PCBLF #X       PCBLF #Y       PCBLF #Z       PCBLM #X       PCBLM #Y       PCBLM #Z       *
CABLE 1  20.331       -.23137E-12   20496.         -4350.1        -55.816        -20039.        -334.89        .82765E+06  -2232.6                    I
CABLE 2  20.331       -.23137E-12   0.             0.             0.             0.             0.             0.             0.                         I
CABLE 3  18.331        .29485E-12   20495.         4150.9         55.816        -20070.         334.89        -.82770E+06  -2232.6                    I
CABLE 4  18.331        .29485E-12   0.             0.             0.             0.             0.             0.             0.                         I

         *              %
CABLE 1                 I              I
CABLE 2                 I              I
CABLE 3                 I              I
CABLE 4                 I              I


  TRIM CASE NUMBER      1

  THIS TRIM CONVERGED SATISFACTORILY

  TRIM ALGORITHM CONTROL
  ITERATIONS =    17      RESTARTS =     0      CONV. CRIT. =    .305E-09
  LCONTL =    .12574 VCONTL =    .07049 NDCNTL =   -.17257 PCONTL =    .30461 QCONTL =    .00867 RCONTL =   -.00787
  CONTROL LIMITS FLAGGED DURING TRIM
     ITHER                  ITHER                  TA1SR                  TB1SR          SNGMTX    AILERON  ELEVATOR  RUDDER
  0  0  0  0        0  0  0  0        0  0  0  0        0  0  0  0        0         0         0         0
```

SIMULATION TIME -- -1.00

	L	V	W	P	Q	R	X	Y	Z	PHI
MLLL	44.000	-5.0000	0.	0.	.49917E-02	.49750E-01	0.	0.	-1000.0	.10000
	THETA	PSI	AXCGG	AYCGG	AZCGG	NDHHT	NDTHT	VHGUST8X	OHGUST8Y	OHGUST8Z
MLLL	0.	0.	.77314E-02	.66937E-01	-.68264E-02	9.8694	9.2413	0.	0.	0.
	CUCCAH	CUCCYH	CVCDYH	VDRFCT8X	VDRFGT8Y	VCRHGT8Z	CCHGST8X	OCHGST8Y	OCHGST8Z	VCHGST8X
MLLL	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
	VCHCST8Y	VCHCST8Z	GCRCAC8X	GCRDAC8Y	GCRCAC8Z	HGCHAC8X	HGCHAC8Y	HGCHAC8Z	VTGUST8X	VTGUST8Y
MLLL	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
	VTGLST8Z	CTGLST8X	CTGLST8Y	CTGUST8Z	CLGCXT	CUGCYT	CVGCYT	VCRTGT8X	VCRTGT8Y	VCRTGT8Z
MLLL	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
	CCTGST8X	CCICST8Y	CCTGST8Z	VCTGST8X	VCTGST8Y	VCTGST8Z	HGCTAC8X	HGCTAC8Y	HGCTAC8Z	RVHLCV8X
MLLL	0.	0.	0.	0.	0.	0.	0.	0.	0.	42.947
	RVHLCV8Y	RVHLCV8Z	RCHLCV8X	RCHLCV8Y	RCHLCV8Z	GAMMAH	LAMDAH	ZETAH	TRATCH	RVTAIL8X
MLLL	-4.8312	-3.1831	0.	.49917E-02	.49750E-01	.10000	-2.1534	2.2534	I	41.835
	RVTAIL8Y	RVTAIL8Z	RCTAIL8X	RCTAIL8Y	RCTAIL8Z	ALT	PALT	BETAT	PBETAT	DELTRO
MLLL	-9.0409	-.31811	0.	.49917E-02	.49750E-01	-.11939E-01	-.11939E-01	-.21574	-.21574	.78675E-02
	ALFT	PALFT	PALFTO	RHIVEL8X	RHIVEL8Y	RHIVEL8Z	PHIVEL8X	PHIVEL8Y	PHIVEL8Z	RTIVEL8X
MLLL	-.23062E-02	-.23062E-02	0.	.98844	-.83121E-01	3.1167	.15949E-02	-.85713E-01	.66464E-01	2.3381
	RTIVEL8Y	RTIVEL8Z	PTIVEL8X	PTIVEL8Y	PTIVEL8Z	RCFLHC	PCFLHC	C FLOW C	TIAC	TCLC
MLLL	-.18356E-01	.73914	.43510E-01	.61346E-02	.15739E-01	.47456	.12918E-01	-41.712	1.0001	1.0808
	ZAVSCT	RHBFCR8X	RHBFCR8Y	RHBFCR8Z	STATBF8X	STATBF8Y	STATBF8Z	GAMBFC8X	GAMBFO8Y	GAMBFO8Z
MLLL	-4.1410	0.	-11457.	-.11419E+06	0.	-11457.	-.11419E+06	0.	0.	0.
	CGHBFC8X	CGHBFC8Y	CGHBFC8Z	RHBFCR8X	RHBFCR8Y	RHBFCR8Z	RHOWFC8X	RHOWFC8Y	RHOWFO8Z	RNOWHO8X
MLLL	0.	0.	0.	0.	-11457.	-.11419E+06	-1346.5	-251.51	658.64	0.
	RHOWHC8Y	RHCWFC8Z	HGAAMF8X	HGAAMF8Y	HGAAMF8Z	HGAAMH8X	HGAAMH8Y	HGAAMH8Z	HGGAMF8X	HGGAMF8Y
MLLL	-.20513E+06	.23587E+06	0.	0.	0.	0.	0.	0.	0.	0.
	HGGAMF8Z	HGGAMH8X	HGGAMH8Y	HGGAMH8Z	RHOGFC8X	RHOGFC8Y	RHOGFC8Z	RHOGMC8X	RHOGMO8Y	RHOGMO8Z
MLLL	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
	GHCIFC8X	GHCIFC8Y	GHCIFC8Z	GHCIMC8X	GHCIMC8Y	GHCIMC8Z	HCACFC8X	HCACFC8Y	HCACFO8Z	HCACMO8X
MLLL	0.	-.22271E-14	.22345E-15	0.	0.	0.	-.16530E-05	-.43760E-05	-.66816E-06	0.
	HCACMC8Y	HCACMC8Z	RHOAF 8X	RHOAF 8Y	RHOAF 8Z	RHOAMC8X	RHOAMC8Y	RHOAMC8Z	HOABF 8X	HOABF 8Y
MLLL	-.41427E-04	-.38577E-05	-1346.5	-251.51	658.64	0.	-.20513E+06	.23587E+06	-1346.5	-11709.
	HCABF 8Z	HCABMC8X	HCABMC8Y	HOABMC8Z	HCTAFC8X	HCTAFC8Y	HOTAFC8Z	HCTAMC8X	HOTAMO8Y	HOTAMO8Z
MLLL	-.11353E+06	-.19472E+06	-.18274E+06	.23587E+06	-1346.5	-11709.	-.11353E+06	-.19472E+06	-.18274E+06	.23587E+06
	TXFCR	TSYFCR	TCYFCR	TSZFCR	TSLMCM	TDLMCM	RTOWFC8X	RTOWFC8Y	RTOWFO8Z	RTOWMO8X
MLLL	-241.35	1206.7	0.	86.631	1193.9	313.85	-241.35	1206.7	86.631	1507.8
	RTCWFC8Y	RTCWMC8Z	TGAAMF8X	TGAAMF8Y	TGAAMF8Z	TGAAMH8X	TGAAMH8Y	TGAAMH8Z	TGGAMF8X	TGGAMF8Y
MLLL	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.

	TGGAMF$Z	TGGAMM$X	TGGAMM$Y	TGGAMM$Z	RTOGFO$X	RTOGFO$Y	RTOGFO$Z	RTOGMO$X	RTOGMO$Y	RTOGMO$Z
HLLL	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
	TCACFC$X	TCACFC$Y	TCACFC$Z	TCACMO$X	TCACMO$Y	TCACMO$Z	RTOAF $X	RTOAF $Y	RTOAF $Z	RTOAMO$X
FLLL	0.	-.942L8E-06	-.7E297E-06	-.22641E-04	-.44E52E-07	-.41579E-08	-241.35	1206.7	86.631	1507.8
	RTOAMC$Y	RTCAFC$Z	TCAFCM$X	TCAFCM$Y	TCAFCM$Z	TCAMOM$X	TCAMOM$Y	TCAMCM$Z	HCACMO$X	HCACMO$Y
HLLL	0.	0.	-241.35	1206.7	86.631	21576.	9319.8	-73913.	0.	-.41427E-04
	HCACMC$Z	TCTAMC$X	TCTAMC$Y	TCTAMO$Z	HABFCR$Y	HABFOR$Z	HABMOM$X	HABMOM$Y	HABMOM$Z	RHOGFO$X
HLLL	-.30577E-05	1507.8	-.44E52E-07	-.41579E-08	-10502.	-.11345E+0E	-.17314E+06	-.17342E+06	.1619EE+06	0.
	HBACFC$X	HBACFC$Y	HBACFC$Z	HBACMC$X	HBACMC$Y	HBACMC$Z	HTOTAF$X	HTOTAF$Y	HTOTAF$Z	HTOTAM$X
HLLL	-.1E933E-05	-.5318L1E-05	-.14311E-05	-.11045E-03	-.80742E-04	.78570E-04	-1587.8	-10502.	-.11345E+06	-.17314E+06
	HTOTAF$Y	HTOTAF$Z	HCBLFC$X	HCBLFC$Y	HCBLFC$Z	HCBLMC$X	HCBLMC$Y	HCBLMC$Z	HGERFC$X	HGERFC$Y
FLLL	-.17342E+06	.1E19EE+0E	-E6E.9E	1331.9	40078.	-44447.	-35081.	4697.5	0.	0.
	HGERFC$Z	HGERMC$X	HGERMC$Y	HGERMC$Z	HCRLCC$X	HCRLOC$Y	HCRLCC$Z	HOZLCC$X	HOZLCC$Y	HOZLCC$Z
HLLL	0.	0.	0.	0.	I	I	I	I	I	I
	UCCP	VCCP	HDTCCM	PHICCM	THECCM	TRATCM	PHRF$X	PHRF$Y	PHRF$Z	PHRF$PSI
HLL_	I	I	I	I	I	I	I	I	I	I
	VHSENS$X	VHSENS$Y	VHSENS$Z	XSPEED	YSPEED	ZSPEED	AXACC	AYACC	AZACC	ROLLRT
HLLL	I	I	I	I	I	I	I	I	I	I
	PTCHRT	TCRRRT	IACELC$X	IACELC$Y	IACELC$Z	UERR	VERR	HDTERR	PHIERR	THEERR
HLLL	I	I	I	I	I	I	I	I	I	I
	TRATER	IERR$X	IERR$Y	IERR$Z	PSIERR	UINT	VINT	HDTINT	PHIINT	THEINT
HLLL	I	I	I	I	I	0.	0.	0.	0.	0.
	TRTINT	UCCNTL	VCCNTL	HDCNTL	PCCNTL	CCONTL	RCONTL	SOLTAL	SOLTEL	SOLTRD
HLLL	0.	I	I	I	I	I	I	I	I	I
	PCLTAL	PCLTEL	PCLTRD	CELTAL	CELTEL	CELTRD				
FLLL	I	I	I	-.46124E-02	-.86E63E-02	.74675E-02				

LFL VARIABLES AT TIME -- -1.03

	U	V	W	PHIO	THETO	PSIO	X	Y	Z	PHI
LFL1	48.228	-3.1147	1.4994	0.	0.	0.	37.895	-85.023	-968.96	0.
LFL2	40.111	-3.1043	-1.5944	0.	0.	0.	38.105	77.162	-952.69	0.
LFL3	46.215	-6.8957	1.8785	0.	0.	0.	-38.105	-85.023	-968.96	0.
LFL4	40.124	-6.8853	-1.2156	0.	0.	0.	-37.895	77.162	-952.69	0.

	THETA	PSI	ACMPT	AOPMT	GERIL #X	GERIL #Y	GERIL #Z	IVSOR #X	IVSOR #Y	IVSOR #Z
LFL1	.35[illegible]E-01	0.	17.427	74.884	38.000	-50.631	-956.15	I	I	I
LFL2	-.35[illegible]E-01	0.	17.137	72.607	38.000	40.909	-946.96	I	I	I
LFL3	.35[illegible]E-01	0.	17.427	74.084	-38.000	-50.631	-956.15	I	I	I
LFL4	-.35[illegible]E-01	0.	17.137	72.687	-38.000	40.909	-946.96	I	I	I

	VSORC #X	VSORC #Y	VSORC #Z	VGUST #X	VGUST #Y	VGUST #Z	RVLFU #X	RVLPU #Y	RVLPU #Z	RVFUS #X
LFL1	I	I	I	0.	0.	0.	48.228	-3.1147	1.4994	59.450
LFL2	I	I	I	0.	0.	0.	40.111	-3.1043	-1.5948	60.776
LFL3	I	I	I	0.	0.	0.	46.215	-6.8957	1.8785	59.449
LFL4	I	I	I	0.	0.	0.	40.124	-6.8853	-1.2156	61.034

	RVFUS #Y	RVFUS #Z	RVRCT #X	RVRCT #Y	RVROT #Z	RVPRP #X	RVPRP #Y	RVPRP #Z	RPIV #X	RPIV #Y
LFL1	-.29572	-38.073	-48.193	-3.1265	1.4994	50.110	.40035	-38.471	-1.8822	-2.8198
LFL2	-.21091	-43.866	37.893	-2.9234	-1.5078	40.414	.48020	-40.040	-3.0317	-2.7246
LFL3	-4.3350	-34.332	46.188	-6.9079	1.8785	49.925	-3.6389	-34.437	-1.7058	-2.5638
LFL4	-4.2371	-38.285	38.861	-6.8625	-1.1784	41.528	-3.5499	-35.675	-2.7172	-2.4374

	RPIV #Z	RFIV #X	RFIV #Y	RFIV #Z	PFIV #X	PFIV #Y	PFIV #Z	LCSRE	DELTA R	GEFR
LFL1	39.961	-1.8822	-2.8198	39.961	-9.3400	0.	-.32894	4.8416	.14126E-01	1.0000
LFL2	38.409	-3.0317	-2.7246	38.409	-19.814	0.	.66975	4.6455	.12896E-01	1.0000
LFL3	36.246	-1.7058	-2.5638	36.246	-9.5247	0.	-.33544	4.7137	.12965E-01	1.0000
LFL4	34.432	-2.7172	-2.4374	34.432	-19.396	0.	.67517	4.5241	.11889E-01	1.0000

	LCSFC	DELTA P	GEFP	STMER	SA1SR	SB1SR	SOMGR	PTMER	PA1SR	PB1SR
LFL1	3.0995	.9E5[illegible]E-02	1.0000	I	I	I	I	I	I	I
LFL2	4.3292	.9074[illegible]E-02	1.0000	I	I	I	I	I	I	I
LFL3	3.8892	.8E4E3E-02	1.0000	I	I	I	I	I	I	I
LFL4	4.2911	.9046[illegible]E-02	1.0000	I	I	I	I	I	I	I

	TMEGR	A1SR	B1SR	CMEGR	STMEP	SCMGP	PTMEP	TMEGP	CMEGP	TR
LFL1	.1E5E5	.70454E-01	.4713EE-01	23.250	I	I	I	.11788	125.66	16827.
LFL2	.17E62	.70454E-01	.7[illegible]6E-01	23.250	I	I	I	.13361	125.66	13405.
LFL3	.1E851	.70454E-01	.4713EE-01	23.250	I	I	I	.11788	125.66	14305.
LFL4	.15928	.70454E-01	.7[illegible]6E-01	23.250	I	I	I	.13361	125.66	11853.

	CM	RLTFC #X	RCTFC #Y	ROTFC #Z	RCTMC #X	RCTMO #Y	ROTMO #Z	TP	CP	PROPF #X
LFL1	24322.	258.44	-1555.7	-15963.	9748.7	-3521.2	24234.	253.80	254.94	253.29
LFL2	22935.	75.[illegible]63	1193.1	-13330.	6555.3	-6858.9	22807.	528.44	379.36	528.52
LFL3	23164.	251.45	1389.4	-14245.	8778.0	-3459.6	20091.	250.59	254.05	250.12
LFL4	18955.	658.87	-1364.5	-11769.	5963.8	-6215.2	18889.	503.54	371.47	533.59

	PROPF #Y	PROPF #Z	PROPM #X	PROPM #Y	PROPM #Z	FUSFO #X	FUSFO #Y	FUSFO #Z	FUSMO #X	FUSMO #Y
LFL1	-.9[illegible]E-01	16.827	-254.78	-263.57	-10.353	-77.756	.17578E-01	936.39	0.	0.
LFL2	-.14258	-6.9270	-379.13	96.978	11.201	-81.263	.89469E-02	1069.4	0.	0.
LFL3	.09503	17.718	-253.65	-240.05	3.5972	-77.753	3.7772	748.16	0.	0.
LFL4	1.0588	-7.3466	-371.24	102.76	27.718	-81.872	3.6086	650.55	0.	0.

	FUSPC #Z	JETFS	JETFO #X	JETFC #Y	JETFC #Z	JETMO #X	JETMC #Y	JETMC #Z	LPAFO #X	LPAFC #Y
LFL1	0.	136.00	98.545	0.	-16.597	0.	-465.60	0.	532.52	1555.6
LFL2	0.	136.00	98.545	0.	-16.597	0.	-465.60	0.	1296.4	1193.0
LFL3	0.	136.00	98.545	0.	-16.597	0.	-465.60	0.	562.36	1394.1
LFL4	0.	136.00	98.545	0.	-16.597	0.	-465.60	0.	1217.1	1069.2

	LFAFC #Z	LFAMC #X	LFAMO #Y	LFAMC #Z	HCBLF #X	HCBLF #Y	HCBLF #Z	HCBLM #X	HCBLM #Y	HCBLM #Z
LFL1	-15325.	3431.9	-4256.4	24224.	3814.8	731.21	20134.	-24401.	-.59754E+06	26324.
LFL2	-12290.	6176.1	-7237.6	22313.	0.	0.	0.	0.	0.	0.
LFL3	-13456.	8524.2	-4173.2	26395.	-4683.8	600.73	19943.	-20046.	.56166E+06	-21626.
LFL4	-10562.	5552.5	-6574.1	18917.	0.	0.	0.	0.	0.	0.

	CCPRS	GCFCR #X	GCFCR #Y	GCFCR #Z	FKTNG	GFFOR #X	GFFCR #Y	GFFCR #Z	GERFO #X	GERFO #Y
LFL1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
LFL2	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
LFL3	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
LFL4	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.

	GERFC #Z	HGRFC #X	HGRFC #Y	HGRMC #Z	CF #X	CF #Y	CF #Z	CM #X	CM #Y	CM #Z
LFL1	0.	0.	0.	0.	-36.614	1782.4	-6019.3	15678.	-4775.2	23690.
LFL2	0.	0.	0.	0.	1682.8	1532.6	-3233.8	5968.9	-11941.	23181.
LFL3	0.	0.	0.	0.	-6.4018	1620.9	-4792.4	14082.	-4628.3	19614.
LFL4	0.	0.	0.	0.	1504.0	1408.8	-1010.0	9151.0	-10884.	19249.

	A0R	A1R	B1R	CLAVR	ALAVR	VTR	THINR	ROTIV #X	ROTIV #Y	ROTIV #Z
LFL1	.25215	.33645E-01	.24652E-01	.62136	.12844	36.990	25.028	-1.1764	-1.7615	24.938
LFL2	.22302	.22107E-01	.16603E-01	.52010	.11196	33.828	24.193	-1.8948	-1.7029	24.055
LFL3	.23077	.28080E-01	.22749E-01	.55506	.11775	34.946	22.735	-1.0686	-1.6005	22.654
LFL4	.23225	.24706E-01	.15767E-01	.45991	.10166	31.810	21.640	-1.6951	-1.5234	21.520

	CSKLR	FCHIF R	CLAVP	ALAVP	VTP	THINP	PRPIV #X	PRPIV #Y	PRPIV #Z	DSKLP
LFL1	6.5073	1028.1	.73443E-01	.18853E-01	19.898	5.8411	-5.8375	0.	-.20559	1.8830
LFL2	5.4423	969.51	.15292	.35322E-01	28.712	12.392	-12.384	0.	.43105	3.9207
LFL3	5.8031	952.37	.72514E-01	.18645E-01	19.772	5.9566	-5.9529	0.	-.20965	1.8592
LFL4	4.8125	802.96	.14571	.33957E-01	28.027	12.130	-12.122	0.	.42198	3.7368

	FCHEN P	LCLAT	GRAT
LFL1	58.247	3.3200	0.
LFL2	86.673	3.3200	0.
LFL3	58.643	3.3200	0.
LFL4	84.870	3.3200	0.

TAIL AERODYNAMIC REGIMES   ANGLE OF ATTACK - 1   ANGLE OF SLIDESLIP - 1   ROLLING ANGLE OF ATTACK - 1

* *

36 THE LINEARIZATION ANGULAR INCREMENTS ARE LARGE ENOUGH TO CAUSE SOME OF THE CABLES TO GO SLACK. THEY ARE BEING RESET
SUBROUTINE CFINC
NEW FY INC = .32140431E-03
OLD FY INC = .32500000E-03

* *

36 THE LINEARIZATION ANGULAR INCREMENTS ARE LARGE ENOUGH TO CAUSE SOME OF THE CABLES TO GO SLACK. THEY ARE BEING RESET
SUBROUTINE CFINC
NEW FL INC = .26453462E-03
OLD FL INC = .14000000E-02

ORIGINAL PAGE IS
OF POOR QUALITY

APPENDIX C

SAMPLE INPUT DATA FILES

This appendix contains an example of each data file necessary for the program. With the exception of PAYDTA, PYOUTL, MORDTA, and RG1-RG6, these files were used to create the first sample run listed in Appendix C.

File PAYDTA and PYOUTL were used by the second sample run in Appendix C but the other data files were not part of that run. MORDTA and RG1-RG6 were not necessary for either of those runs.

The files which use namelist format have either "1" or "0" in column one. The namelist facility on CDC NOS and SCOPE systems ignores the first column. All names must start in column two.

INTERACTIVE QUESTION RESPONSES (INPUT) DATA FILE

QUESTION	INTERACTIVE RESPONSE (INPUT)
Six degrees of freedom simulation ? T/F	T
How many trim flight condition ?	01
Generation of plotting files ? T/F	F
Do you want English units ? T/F	T
Full header ? T/F	T
Any comments ? (6 lines)	TEST RUN15 FLIGHT CONTROL SYSTEM COMMANDS CLIMBING TURN

Geometry-Mass (GMDTA) Data File

```
1$NHULL
OHULTH   = 240.0,
OHULDIA  = 103.0,
OHULVOL  = 1.5E+06,
OHULARA  = 19415.0,
OHULID   = 1,
0$END
1$NTAIL
ONUMFIN  = 2,
ORTALOC  = -87.5, 0.0, 0.0,
OTALARA  = 2520.0,
OTSPAN   = 110.0,
OTALID   = 1,
0$END
1$NRATCH
ORATCH1  = 38.0, -81.5, 59.0,
ORATCH2  = 38.0, 81.5, 59.0,
ORATCH3  = -38.0, -81.5, 59.0,
ORATCH4  = -38.0, 81.5, 59.0,
0$END
1$NLPU
ONUMLPU  = 4.
OLPUID   = 1,
0$END
1$NRROTR
ORROTR1  = 0., 0., -7.,
ORROTR2  = 0., 0., -7.,
ORROTR3  = 0., 0., -7.,
ORROTR4  = 0., 0., -7.,
0$END
1$NRGEOM
ONRBLD1  = 4,
ORADRT1  = 28.0,
OCORDR1  = 1.37,
ONRBLD2  = 4,
ORADRT2  = 28.0,
OCORDR2  = 1.37,
ONRBLD3  = 4,
ORADRT3  = 28.0,
OCORDR3  = 1.37,
ONRBLD4  = 4,
ORADRT4  = 28.0,
OCORDR4  = 1.37,
0$END
1$NRPROP
ORPROP1  = 14., 0., 0.,
ORPROP2  = 14., 0., 0.,
ORPROP3  = 14., 0., 0.,
ORPROP4  = 14., 0., 0.,
0$END
1$NPGEOM
ONPBLD1  = 3,
ORADP1   = 6.55,
OCORDP1  = 0.655,
ONPBLD2  = 3,
ORADP2   = 6.55,
OCORDP2  = 0.655,
ONPBLD3  = 3,
ORADP3   = 6.55,
OCORDP3  = 0.655,
```

```
ONPBL04   = 3.
ORADP4    = 6.55,
OCORDP4   = 0.455.
O$END
1$NPRPRIG
OA1SP1    = 0.0,
OA1SP2    = 0.0,
OA1SP3    = 0.0,
OA1SP4    = 0.0,
OB1SP1    = 1.606,
OB1SP2    = 1.536,
OB1SP3    = 1.606,
OB1SP4    = 1.536,
O$END
1$NRLTCH
ORLTCH1   = 0.0, 0.0, 3.0,
ORLTCH2   = 0.0, 0.0, 3.0,
ORLTCH3   = 0.0, 0.0, 3.0,
ORLTCH4   = 0.0, 0.0, 3.0,
O$END
1$NGBANG
OGBANG1   = 0.0, 0.035, 0.0,
OGBANG2   = 0.0, -0.035, 0.0,
OGBANG3   = 0.0, 0.035, 0.0,
OGBANG4   = 0.0, -0.035, 0.0,
O$END
1$NMAST
OMASTLC = 0.0, 0.0, -65.0136,
ORMORPT = 120.0, 0.0, 0.0,
O$END
1$NRATHG
ORATHG1 = 36.0, -46.0, 62.0,
ORATHG2 = 36.0, 46.0, 62.0,
ORATHG3 = -36.0, -46.0, 62.0,
ORATHG4 = -36.0, 46.0, 62.0,
O$END
1$NLANDGL
OLGRLN1 = 3.32,
OLGRLN2 = 3.32,
OLGRLN3 = 3.32,
OLGRLN4 = 3.32,
O$END
1$NGEARK
OGEARK1 = 7770.0,
OGEARK2 = 7770.0,
OGEARK3 = 7770.0,
OGEARK4 = 7770.0,
O$END
1$NGFRAMK
OGFRMK1 = 77700.0,
OGFRMK2 = 77700.0,
OGFRMK3 = 77700.0,
OGFRMK4 = 77700.0,
O$END
1$NGEARC
OGEARC1 = 1554.0,
OGEARC2 = 1554.0,
OGEARC3 = 1554.0,
OGEARC4 = 1554.0,
O$END
1$NMUKG
OMUKG1    = 0.08,
```

```
OMUKG2  = 0.08,
OMUKG3  = 0.08,
OMUKG4  = 0.08,
O$END
1$NRHULCG
ORHULCG  = 0.0, 0.0, 16.63,
O$END
1$NMASHUL
OMASHUL  = 2761.9,
OIHULXX  = 6.35E+06,
OIHULYY  = 1.3478E+07,
OIHULZZ  = 1.3292E+07,
OIHULXZ  = 0.0,
O$END
1$NRCGLPU
ORCGLP1  = 0.0,0.0, 0.0,
ORCGLP2  = 0.0,0.0, 0.0,
ORCGLP3  = 0.0,0.0, 0.0,
ORCGLP4  = 0.0,0.0, 0.0,
O$END
1$NMASLP1
OMASLP1  = 279.5,
OILP1XX  = 8570.0,
OILP1YY  = 4.006E+04,
OILP1ZZ  = 3.94E+04,
OILP1XZ  = 0.0,
O$END
1$NMASLP2
OMASLP2  = 279.5,
OILP2XX  = 8570.0,
OILP2YY  = 4.006E+04,
OILP2ZZ  = 3.94E+04,
OILP2XZ  = 0.0,
O$END
1$NMASLP3
OMASLP3  = 279.5,
OILP3XX  = 8570.0,
OILP3YY  = 4.006E+04,
OILP3ZZ  = 3.94E+04,
OILP3XZ  = 0.0,
O$END
1$NMASLP4
OMASLP4  = 279.5,
OILP4XX  = 8570.0,
OILP4YY  = 4.006E+04,
OILP4ZZ  = 3.94E+04,
OILP4XZ  = 0.0,
O$END
1$NLOCKNR
OLOCNR1  = 15.0,
OLOCNR2  = 15.0,
OLOCNR3  = 15.0,
OLOCNR4  = 15.0,
O$END
1$NJETHST
OJETHS1 = 100.0,
OREXLC1 = -10.0, 0.0, -3.0,
OJETHS2 = 100.0,
OREXLC2 = -10.0, 0.0, -3.0,
OJETHS3 = 100.0,
OREXLC3 = -10.0, 0.0, -3.0,
OJETHS4 = 100.0,
```

```
OREXLC4 = -10.0, 0.0, -3.0,
O$END
1$NJETHSA
OA1SE1  = 0.0,
OB1SE1  = 1.4,
OA1SE2  = 0.0,
OB1SE2  = 1.4,
OA1SE3  = 0.0,
OB1SE3  = 1.4,
OA1SE4  = 0.0,
OB1SE4  = 1.4,
O$END
```

Aerodynamic Variables (ARODTA) Data File

```
1$NRACLP
ORACLP1  = 0.0, 0.0, 0.0,
ORACLP2  = 0.0, 0.0, 0.0,
ORACLP3  = 0.0, 0.0, 0.0,
ORACLP4  = 0.0, 0.0, 0.0,
0$END
1$NRAROCN
OLCSR1   = 5.73,
ODLTR1A  = 0.0087,
ODLTR1B  = -0.0216,
ODLTR1C  = 0.4,
OLCSR2   = 5.73,
ODLTR2A  = 0.0087,
ODLTR2B  = -0.0216,
ODLTR2C  = 0.4,
OLCSR3   = 5.73,
ODLTR3A  = 0.0087,
ODLTR3B  = -0.0216,
ODLTR3C  = 0.4,
OLCSR4   = 5.73,
ODLTR4A  = 0.0087,
ODLTR4B  = -0.0216,
ODLTR4C  = 0.4,
0$END
1$NPAROCN
OLCSP1   = 5.73,
ODLTP1A  = 0.0087,
ODLTP1B  = -0.0216,
ODLTP1C  = 0.4,
OLCSP2   = 5.73,
ODLTP2A  = 0.0087,
ODLTP2B  = -0.0216,
ODLTP2C  = 0.4,
OLCSP3   = 5.73,
ODLTP3A  = 0.0087,
ODLTP3B  = -0.0216,
ODLTP3C  = 0.4,
OLCSP4   = 5.73,
ODLTP4A  = 0.0087,
ODLTP4B  = -0.0216,
ODLTP4C  = 0.4,
0$END
1$NFARDCN
OXUUAF1  = -0.022,
OYVVAF1  = -0.201,
OZWWAF1  = -0.646,
OXUUAF2  = -0.022,
OYVVAF2  = -0.201,
OZWWAF2  = -0.646,
OXUUAF3  = -0.022,
OYVVAF3  = -0.201,
OZWWAF3  = -0.646,
OXUUAF4  = -0.022,
OYVVAF4  = -0.201,
OZWWAF4  = -0.646,
0$END
1$NHDTDRV
OXUDOTH  = -663.38,
OYVDOTH  = -2600.02,
OZWDOTH  = -2600.02,
```

```
OLPDOTH  = 0.0,
OMQDOTH  = -3.61E06,
ONRDOTH  = -3.61E06,
O$END
1$NTDTDRV
OYVDOTT  = -489.4,
OZWDOTT  = -605.,
OLVDOTT  = -9787.2,
OLPDOTT  = -3.866E05,
OMQDOTT  = -3891.0,
ONRDOTT  = -3891.0,
O$END
1$NHDRVS
OXUUABH  = -0.4136,
OXQWH    = -2600.02,
OXRVH    = 2600.02,
OYVVABH  = -28.042,
OYRRABH  = 0.0,
OYPWH    = 2600.02,
OYRUH    = -663.38,
OYRVABH  = 0.0,
OZWWABH  = -28.042,
OZQQABH  = 0.0,
OZPVH    = -2600.02,
OZQUH    = 663.38,
OZQWABH  = 0.0,
OLPPABH  = -1.3141E04,
OLPUABH  = 0.0,
OLVWH    = 0.0,
OLQBRH   = -3.61E6,
OLRBQH   = 3.61E6,
OMQQABH  = -8.22E06,
OMUWH    = 1452.48,
OMRBPH   = 0.0,
OMPBRH   = 3.61E06,
OMQWABH  = -2.017E05,
ONRRABH  = -8.22E06,
ONUVH    = -1452.48,
ONPBQH   = -3.61E6,
ONQBPH   = 0.0,
ONRVABH  = -2.017E05,
O$END
1$NTDRVS
OXUUABT  = -0.1379,
OYVVABT  = -2.4458,
OYPPABT  = -3233.1,
OYAPVST  = -1.467,
OYBVSQT  = -2.67,
OYBSVST  = -1.7343,
OYAPSVS  = -2.939,
OZWWABT  = -2.4458,
OZAVSQT  = -4.141,
OZASVST  = -0.400,
OLVVABT  = -4.89,
OLPPABT  = -1.707E05,
OLAPVST  = -77.4,
OLBVSQT  = -3.03,
OLBAVST  = -1.52,
OLAPSVS  = -155.1,
O$END
1$NTPARAM
OLAMTXQ  = 0.7,
```

ARODTA (Concluded)

```
OLAMTXR  = 0.7,
OLAMTZQ  = 1.0,
OAL1T    = 0.5236,
OAL2T    = 0.6981,
OBETA1T  = 0.5236,
OBETA2T  = 0.6981,
OALP1T   = 0.5236,
OALP2T   = 0.6981,
O$END
1$NTAUTS
OTAUA    = 0.5,
OTAUE    = 0.5,
OTAUR    = 0.5,
O$END
```

Propeller-Rotor Limits (PLMDTA) Data File

```
1$NRTRMSD
OOMEGR1  = 23.25,
OOMEGR2  = 23.25,
OOMEGR3  = 23.25,
OOMEGR4  = 23.25,
O$END
1$NPTRMSD
OOMEGP1  = 125.66,
OOMEGP2  = 125.66,
OOMEGP3  = 125.66,
OOMEGP4  = 125.66,
O$END
1$NMECLIM
OTHERMX  = 0.5,
OA1SRMX  = 0.5,
OB1SRMX  = 0.5,
OTHEPMX  = 0.5,
ODLALMX = 1.0,
ODLELMX = 1.0,
ODLRDMX = 1.0,
O$END
```

Interference Constants (IFCDTA) Data File

```
1$NSHDRCN
OBWK1R1 =    1.745,
OBWK2R1 =    2.9671,
OMXBDR1 =    0.85,
OLWK1R1 =    1.31,
OLWK2R1 =    2.8798,
OMXLDR1 =    0.85,
OBWK1R2 =    3.3161,
OBWK2R2 =    4.5379,
OMXBDR2 =    0.85,
OLWK1R2 =    3.4034,
OLWK2R2 =    4.9742,
OMXLDR2 =    0.85,
OBWK1R3 =    0.1745,
OBWK2R3 =    1.3963,
OMXBDR3 =    0.85,
OLWK1R3 =    1.31,
OLWK2R3 =    2.8798,
OMXLDR3 =    0.85,
OBWK1R4 =    4.8869,
OBWK2R4 =    6.1087,
OMXBDR4 =    0.85,
OLWK1R4 =    3.4034,
OLWK2R4 =    4.9742,
OMXLDR4 =    0.85,
O$END
1$NKHR
OKHRA1   =   12.0,
OKHRB1   =   0.0333,
OKHRA2   =   12.0,
OKHRB2   =   0.0333,
OKHRA3   =   12.0,
OKHRB3   =   0.0333,
OKHRA4   =   12.0,
OKHRB4   =   0.0333,
O$END
1$NKGR
OKGR1    =   -2.0,
OKGR2    =   -2.0,
OKGR3    =   -2.0,
OKGR4    =   -2.0,
O$END
1$NSHDPCN
OBWK1P1 =    1.745,
OBWK2P1 =    2.9671,
OMXBDP1 =    0.85,
OLWK1P1 =    1.31,
OLWK2P1 =    2.8798,
OMXLDP1 =    0.85,
OBWK1P2 =    3.3161,
OBWK2P2 =    4.5379,
OMXBDP2 =    0.85,
OLWK1P2 =    3.4034,
OLWK2P2 =    4.9742,
OMXLDP2 =    0.85,
OBWK1P3 =    0.1745,
OBWK2P3 =    1.3963,
OMXBDP3 =    0.85,
OLWK1P3 =    1.31,
OLWK2P3 =    2.8798,
```

```
 OMXLDP3 =    0.85,
 OBWK1P4 =    4.8869,
 OBWK2P4 =    6.1087,
 OMXBDP4 =    0.85,
 OLWK1P4 =    3.4034,
 OLWK2P4 =    4.9742,
 OMXLDP4 =    0.85,
 O$END
 1$NKHP
 OKHPA1  =    12.0,
 OKHPB1  =    0.0333,
 OKHPA2  =    12.0,
 OKHPB2  =    0.0333,
 OKHPA3  =    12.0,
 OKHPB3  =    0.0333,
 OKHPA4  =    12.0,
 OKHPB4  =    0.0333,
 O$END
 1$NKRP
 OKRP1   =    1.6,
 OKRP2   =    1.6,
 OKRP3   =    1.6,
 OKRP4   =    1.6,
 O$END
 1$NKGP
 OKGP1   =    -2.0,
 OKGP2   =    -2.0,
 OKGP3   =    -2.0,
 OKGP4   =    -2.0,
 O$END
 1$NSHDFCN
 OBWK1F1 =    1.745,
 OBWK2F1 =    2.9671,
 OMXBDF1 =    0.85,
 OLWK1F1 =    1.31,
 OLWK2F1 =    2.8798,
 OMXLDF1 =    0.85,
 OBWK1F2 =    3.3161,
 OBWK2F2 =    4.5379,
 OMXBDF2 =    0.85,
 OLWK1F2 =    3.4034,
 OLWK2F2 =    4.9742,
 OMXLDF2 =    0.85,
 OBWK1F3 =    0.1745,
 OBWK2F3 =    1.3963,
 OMXBDF3 =    0.85,
 OLWK1F3 =    1.31,
 OLWK2F3 =    2.8798,
 OMXLDF3 =    0.85,
 OBWK1F4 =    4.8869,
 OBWK2F4 =    6.1087,
 OMXBDF4 =    0.85,
 OLWK1F4 =    3.4034,
 OLWK2F4 =    4.9742,
 OMXLDF4 =    0.85,
 O$END
 1$NKRF
 OKRF1   =    1.6,
 OKRF2   =    1.6,
 OKRF3   =    1.6,
 OKRF4   =    1.6,
 O$END
```

```
0$NKPF
OKPF1    =    1.6,
OKPF2    =    1.6,
OKPF3    =    1.6,
OKPF4    =    1.6,
0$END
1$NKGHCN
OKGHA    =    -4.10,
OKGHB    =    -4.10,
0$END
1$NKRH
OKRHA1   =    0.0,
OKRHB1   =    1.0E-4,
OKRHC1   =    0.2,
OKRHD1   =    -0.043,
OKRHE1   =    0.0333,
OKRHA2   =    0.0,
OKRHB2   =    1.0E-4,
OKRHC2   =    0.2,
OKRHD2   =    0.043,
OKRHE2   =    0.0333,
OKRHA3   =    0.0,
OKRHB3   =    1.0E-4,
OKRHC3   =    -0.2,
OKRHD3   =    -0.043,
OKRHE3   =    0.0333,
OKRHA4   =    0.0,
OKRHB4   =    1.0E-4,
OKRHC4   =    -0.2,
OKRHD4   =    0.043,
OKRHE4   =    0.0333,
0$END
1$NKPH
OKPHA1   =    0.0,
OKPHB1   =    5.39E-6,
OKPHC1   =    0.0109,
OKPHD1   =    -0.00236,
OKPHE1   =    0.00183,
OKPHA2   =    0.0,
OKPHB2   =    5.39E-6,
OKPHC2   =    0.0109,
OKPHD2   =    -0.00236,
OKPHE2   =    0.00183,
OKPHA3   =    0.0,
OKPHB3   =    5.39E-6,
OKPHC3   =    -0.0109,
OKPHD3   =    -0.00236,
OKPHE3   =    0.00183,
OKPHA4   =    0.0,
OKPHB4   =    5.39E-6,
OKPHC4   =    -0.0109,
OKPHD4   =    -0.00236,
OKPHE4   =    0.00183,
0$END
1$NKRT
OKRTA1   =    1.4E-2,
OKRTB1   =    -5.7E-3,
OKRTC1   =    5.1E-3,
OKRTA2   =    1.4E-2,
OKRTB2   =    5.7E-3,
OKRTC2   =    5.1E-3,
OKRTA3   =    3.04E-2,
```

IFCDTA (Concluded)

```
OKRTB3  =   -1.24E-2,
OKRTC3  =   1.1E-2,
OKRTA4  =   3.04E-2,
OKRTB4  =   1.24E-2,
OKRTC4  =   1.1E-2,
O$END
1$NKPT
OKPTA1  =   7.6E-4,
OKPTB1  =   -3.07E-4,
OKPTC1  =   2.75E-4,
OKPTA2  =   7.6E-4,
OKPTB2  =   3.07E-4,
OKPTC2  =   2.75E-4,
OKPTA3  =   1.64E-3,
OKPTB3  =   -6.68E-4,
OKPTC3  =   5.93E-4,
OKPTA4  =   1.64E-3,
OKPTB4  =   6.68E-4,
OKPTC4  =   5.93E-4,
O$END
1$NKGT
OKGTA   = -51.77,
OKGTB   = 16.0,
O$END
```

Trim Conditions (TRMDTA) Data File

```
SUBROUTINE INSTAT
1$NINSTAT
OVHUL    = 14.0, 0.0, 0.0,
OHULPOS  = 0.0 ,0.0, -1000.0,
OHULELR  = 0.0, 0.0, 0.0,
OHULEUL  = 0.0, 0.0, 0.0,
O$END
SUBROUTINE INATMOS
1$NATMOS
OAIRDEN  = 0.002378,
ODENRAT  = 1.0,
OGRAV    = 32.174,
OVWIND   = -30.0, 0.0, 0.0,
O$END
1$NSTABDV
ODERVFL  = T,
OAMATFL  = T,
OBMATFL  = T,
OBPMTFL  = T,
OCMATFL  = T,
OCFMTFL  = T,
O$END
```

Time History Parameter (HISDTA) Data File


```
1$NFCSLIM
OUILM    = 0.35,
OULLM    = 0.4,
OVILM    = 0.4,
OVLLM    = 0.45,
OHDTILM  = 0.35,
OHDTLLM  = 0.4,
OPHIILM  = 0.35,
OPHILLM  = 0.4,
OTHEILM  = 0.35,
OTHELLM  = 0.4,
ORILM    = 0.35,
ORLLM    = 0.4,
0$END
1$NLLOSLP
OULPFLG  = T,
OVLPFLG  = T,
OHDTLPF  = T,
OPLPFLG  = T,
OQLPFLG  = T,
OTRTLPF  = T,
0$END
1$NFDBKFL
OUFDBK   = T,
OVFDBK   = T,
ORFDBK   = T,
0$END
1$NFCSGNS
OKUSPED  = 0.129,
OKIU     = 0.01,
OTAXAC   = 0.0,
OKVSPED  = 0.30,
OKIV     = 0.01,
OTAYAC   = 0.,
OKHDOT   = 0.0222,
OKIHDOT  = 0.053,
OTAZAC   = 0.,
OKPHI    = 0.218,
OKIPHI   = 0.14,
OTROLRT  = 1.335,
OKTHETA  = 0.476,
OKITHET  = 0.1,
OTPTHRT  = 2.48,
OKTRAT   = 7.08,
OKIR     = 0.01,
0$END
1$NPOSHCS
OPOSHT1 = 2000.0,
OPOSHT2 = 2200.0,
OKX      = 1.0,
OKY      = 0.2,
OKH      = 1.0,
OKPSI    = 1.0,
0$END
1$NRSENSR
ORACELC  = 0.0, 0.0, 16.63,
ORVSNLC  = 0.0, 0.0, 0.0,
0$END
1$NRSWASH
OPTCOM1  = 2000.0,
```

```
 ODTCOM2  = 2200.0,
 ODTHER1  = 0.1,
 ODA1SR1  = 0.0,
 ODB1SR1  = 0.0,
 ODTHER2  = 0.1,
 ODA1SR2  = 0.0,
 ODB1SR2  = 0.0,
 ODTHER3  = 0.1,
 ODA1SR3  = 0.0,
 ODB1SR3  = 0.0,
 ODTHER4  = 0.1,
 ODA1SR4  = 0.0,
 ODB1SR4  = 0.0,
 O$END
 1$NPFETHR
 OPTCOM1  = 2000.0,
 OPTCOM2  = 2200.0,
 ODTHEP1  = 0.1,
 ODTHEP2  = 0.1,
 ODTHEP3  = 0.1,
 ODTHEP4  = 0.1,
 O$END
 1$NLNKCOM
 OLKTCM1  = 2000.0,
 OLKTCM2  = 2200.0,
 ODUDCNL  = 0.0,
 ODVDCNL  = 0.0,
 ODWDCNL  = 0.0,
 ODPCNTL  = 0.0,
 ODQCNTL  = 0.0,
 ODRCNTL  = 0.0,
 O$END
 1$NTDEFLC
 OTTCOM1 = 2000.0,
 OTTCOM2 = 2200.0,
 ODDLTAL = 0.0,
 ODDLTEL = 0.0,
 ODDLTRD = 0.0,
 O$END
 1$NCOMAND
  UCMD    = 1.0, 30.0,
  VCMD    = 1.0, 0.0,
            2.0, 6.0,
  HDTCMD  = 1.0, 5.0,
  PHICMD  = 1.0, 0.0,
            2.0, 0.2,
  THECMD  = 1.0, 0.1,
  TRTCMD  = 1.0, 0.0,
            2.0, 0.3,
 O$END
 SUBROUTINE INGUST
 1$NHSCOM
 OHT1GST  = 2000.0,
 OHT2GST  = 2200.0,
 OUHGMAX  = 0.0,
 OVHGMAX  = 0.0,
 OWHGMAX  = 0.0,
 OPHGMAX  = 0.0,
 OQHGMAX  = 0.0,
 ORHGMAX  = 0.0,
 ODUXHMX  = 0.0,
 ODUYHMX  = 0.0,
```

```
 ODVYHMX  = 0.0,
 O$END
 1$NTGCOM
 OTT1GST  = 2000.0,
 OTT2GST  = 2200.0,
 OUTGMAX  = 0.0,
 OVTGMAX  = 0.0,
 OWTGMAX  = 0.0,
 OPTGMAX  = 0.0,
 OQTGMAX  = 0.0,
 ORTGMAX  = 0.0,
 ODUXTMX  = 0.0,
 ODUYTMX  = 0.0,
 ODVYTMX  = 0.0,
 O$END
 1$NLPGCOM
 OL1T1GT  = 2000.,
 OL1T2GT  = 2200.,
 OUL1GMX  = 0.0,
 OVL1GMX  = 0.0,
 OWL1GMX  = 0.0,
 OL2T1GT  = 2000.0,
 OL2T2GT  = 2200.0,
 OUL2GMX  = 0.0,
 OVL2GMX  = 0.0,
 OWL2GMX  = 0.0,
 OL3T1GT  = 2000.,
 OL3T2GT  = 2200.,
 OUL3GMX  = 0.0,
 OVL3GMX  = 0.0,
 OWL3GMX  = 0.0,
 OL4T1GT  = 2000.0,
 OL4T2GT  = 2200.0,
 OUL4GMX  = 0.0,
 OVL4GMX  = 0.0,
 OWL4GMX  = 0.0,
 O$END
 1$NGSTRNG
 OGSTFLG = F,
 OGSTSCF = 1.0,
 O$END
 1$NRFSRCLC
 ORFSRCX = 100.0,
 ORASRCX = -100.0,
 ORSORCY = 100.0,
 O$END
 SUBROUTINE INSTEP
 1$NINSTEP
 OTIMSTP  = 0.5,
 OMINSTP  = 0.05,
 OTPRINT  = 1.0,
 OTSIM    = 5.0,
 O$END
```

Payload (PAYDTA) Data File

```
1$NPAYLOD
OPAYLTH = 80.0,
OPAYDTH = 12.0,
OPAYVOL = 11520.0,
OPAYARA = 144.0,
OPAYID  = 1,
0$END
1$NRPTCH
ORPTCH1 = 40.0, 0.0, -6.0,
ORPTCH2 = 40.0, 0.0, -6.0,
ORPTCH3 = -40.0, 0.0, -6.0,
ORPTCH4 = -40.0, 0.0, -6.0,
0$END
1$NRATHP
ORATHP1 =  36.0, 0.0, 50.0,
ORATHP2 =  36.0,  0.0, 50.0,
ORATHP3 = -36.0, 0.0, 50.0,
ORATHP4 = -36.0,  0.0, 50.0,
0$END
1$NUSCLTH
OUSLTH1 = 20.0,
OUSLTH2 = 20.0,
OUSLTH3 = 18.0,
OUSLTH4 = 18.0,
0$END
1$NRPAYCG
ORPAYCG = 0.0, 0.0, 0.0,
0$END
1$NMASPAY
OMASPAY = 1243.24,
OIPAYXX = 29837.8,
OIPAYYY = 677980.2,
OIPAZZ = 677980.2,
OIPAYXZ = 0.0,
0$END
1$NCABLK
OCABLK1 = 62000.0,
OCABLK2 = 0.0,
OCABLK3 = 62000.0,
OCABLK4 = 0.0,
0$END
1$NCABLC
OCABLC1 = 2486.0,
OCABLC2 = 0.0,
OCABLC3 = 2486.,
OCABLC4 = 0.0,
0$END
1$NPDRVS
OXUUABP = -0.2854,
OYVVABP = -2.854,
OZWWABP = -2.854,
ONUVP   = -20.0,
OLPPABP = 0.0,
OMQQABP = -1.0E04,
ONRRABP = -1.0E04,
0$END
1$NINDPST
ODVPYLD = 0.1, 0.2, 0.3,
ODHRPYL = 0.4, 0.5, 0.6,
ODPYELR = 0.01, 0.02, 0.03,
```

PAYDTA (Concluded)

```
ODPYEUL = 0.04, 0.05, 0.06,
O$END
1$NPYGCOM
OPYT1GT = 40.0,
OPYT2GT = 50.0,
OUPYGMX = 0.0,
OVPYGMX = 0.0,
OWPYGMX = 0.0,
OPPYGMX = 0.0,
OQPYGMX = 0.5,
ORPYGMX = 0.0,
O$END
1$NPGSTRN
OPGSTFL = T,
OPGVSCF = 0.1,
OPGOSCF = 0.1,
O$END
```

Mooring (MORDTA) Data File

```
1$NCALMHD
OPSIO    = 0.0,
0$END
1$NTSDEFL
ODELTAL = 0.0,
ODELTEL = 0.0,
ODELTRD = 0.0,
0$END
1$NINDMST
ODHLEUL = 0.0, 0.0, 0.0,
0$END
```

Gust String (RG1 - RG6) Data File

0.0,	2.1,	-1.2,	0.0
0.5,	2.5,	0.0,	0.5
1.0,	2.4,	1.1.	1.0
1.5,	1.9,	1.5,	1.2
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2.5,	0.0	0.0,	0.0

Vehicle Output Variables Code Numbers (OUTLST) Data File

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OUTLST (Continued)

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Payload Output Variables Code Numbers (PYOUTL) Data File

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APPENDIX D

OUTPUT VARIABLES

This table contains all the output listing variable names, their descriptions, and the corresponding engineering symbols used in the Technical Manual. These are tables listing variables pertaining to the hull assembly, the LPUs, the payload, and the payload suspension cables.

This appendix gives a listing of Output Code Numbers and the associated listing labels, description, and engineering symbols. Each set of tables is followed by an alphabetized listing with which the user can look up the appropriate code number then the code number can be used to identify the output variable with the description and engineering symbol given in the chart.

TABLE D-1. HULL ASSEMBLY VARIABLES

CODE NUMBER	OUTPUT LABEL		DESCRIPTION	ENGINEERING SYMBOLS
1	U		Velocity vector of the hull c.g.	$\underline{V}_h$
2	V			
3	W			
4	P		Hull angular velocity vector	$\underline{\omega}_h$
5	Q			
6	R			
7	X		Hull c.g. reference axes inertial position	$\underline{R}_I^h$
8	Y			
9	Z			
10	PHI		Euler angles of hull c.g.	$\underline{\eta}_I^h$
11	THETA			
12	PSI			
13	AXCGG		Hull c.g. inertial acceleration x	$1/g[\dot{\underline{V}}_h +$
14	AYCGG		Hull c.g. inertial acceleration y	
15	AZCGG		Hull c.g. inertial acceleration z	$(\underline{\omega}_h \times \underline{V}_h)]$
16	RHBFOR:	X	Total hull buoyancy force vector	
17		Y	at the center of volume including	$\underline{F}_{B_h}^{hcv}$
18		Z	aerostatic, gust acceleration, and gust gradient effects	
19	RHOAF:	X	Hull only aerodynamic force vector	
20		Y	at the center of volume including	$\underline{F}_{SFGD_h}^{hcv}$
21		Z	all right hand side terms except buoyancy effects	
22	RHOAMO:	X	Hull only aerodynamic moment vector	
23		Y	at the CV including all right hand	$\underline{T}_{SFGD_h}^{hcv}$
24		Z	side terms except buoyancy effects	
25	RTOAF:	X	Tail only aerodynamic force vector	
26		Y	at the tail reference center, right	$\underline{F}_{SFGD_h}^{ht}$
27		Z	hand side terms	
28	RTOAMO:	X	Tail only aerodynamic moment vector	
29		Y	at the tail reference center, right	$\underline{T}_{SFGD_h}^{ht}$
30		Z	hand side terms	
31	HOABF:	X	Hull only aero-buoyancy force vector	
32		Y	at the hull c.g., all right hand	$\underline{F}_{HAB_h}$
33		Z	side terms including buoyancy	

CODE NUMBER	OUTPUT LABEL		DESCRIPTION	ENGINEERING SYMBOLS
34	HOABMO:	X	Hull only aero-buoyancy moment vector	
35		Y	at the hull c.g., all right hand side	$\underline{T}_{HAB_h}$
36		Z	terms including buoyancy	
37	TOAMOM:	X	Tail only aerodynamic moment vector	
38		Y	about hull c.g., all right hand side	$\underline{T}_{TA_h}$
39		Z	terms	
40	TOAFOR:	X	Tail only aerodynamic force vector	
41		Y	at hull c.g., all right hand side	$\underline{F}_{TA_h}$
42		Z	terms	
43	HABFOR:	X	Hull aero-buoyancy force vector at	
44		Y	hull c.g., hull and tail right hand	$\underline{F}_{A_h} - \underline{F}_{HAD_h}$
45		Z	side terms	
46	HABMOM:	X	Hull aero-buoyancy moment vector at	
47		Y	hull c.g., hull and tail right hand	$\underline{T}_{A_h} - \underline{T}_{HAD_h}$
48		Z	side terms	
49	RHOGFO:	X	Hull only gust derivative force	
50		Y	vector at hull center of volume	$\underline{F}_{GD_h}^{hcv}$
51		Z		
52	RHOGMO:	X	Hull only gust derivative moment	
53		Y	vector at hull center of volume	$\underline{T}_{GD_h}^{hcv}$
54		Z		
55	RHOWFO:	X	Hull only steady flow forces acting	
56		Y	at hull center of volume	$\underline{F}_{SF_h}^{hcv}$
57		Z		
58	RHOWMO:	X	Hull only steady flow moments about	
59		Y	hull center of volume	$\underline{T}_{SF_h}^{hcv}$
60		Z		
61	RTOGFO:	X	Tail only gust derivative force	
62		Y	vector at tail centroid	$\underline{F}_{GD_h}^{ht}$
63		Z		
64	RTOGMO:	X	Tail only gust derivative moment	
65		Y	vector about tail centroid	$\underline{T}_{GD_h}^{ht}$
66		Z		
67	TXFOR		Tail X-Force	X_t
68	TSYFOR		Tail static Y-Force	Y_{t_s}
69	TDYFOR		Tail dynamic Y-Force	Y_{t_d}

CODE NUMBER	OUTPUT LABEL		DESCRIPTION	ENGINEERING SYMBOLS
70	TSZFOR		Tail static Z-Force	Z_t
71	TSLMOM		Tail static rolling moment	L_{t_s}
72	TDLMOM		Tail dynamic rolling moment	L_{t_d}
73	ALT		Tail angle of attack	α
74	BETAT		Tail angle of slideslip	β
75	ALPT		Tail rolling angle of attack	α_p
76	PALT		Supplementary tail angle of attack	α'
77	PBETAT		Supplementary tail angle of slideslip	β'
78	PALPT		Supplementary tail rolling angle of attack	α_p'
79	HBACFO:	X	Hull body axis acceleration force vector	$\underline{F}_{HAD_h}$
80		Y		
81		Z		
82	HBACMO:	X	Hull body axis acceleration moment vector	$\underline{T}_{HAD_h}$
83		Y		
84		Z		
85	HTOTAF:	X	Hull total aerodynamic force vector	$\underline{F}_{A_h}$
86		Y		
87		Z		
88	HTOTAM:	X	Hull total aerodynamic moment vector	$\underline{T}_{A_h}$
89		Y		
90		Z		
91	TCACFO:	X	Tail centroid acceleration force vector	$\underline{F}_{AD_h}^{ht}$
92		Y		
93		Z		
94	TCACMO:	X	Tail centroid acceleration force vector	$\underline{T}_{AD_h}^{ht}$
95		Y		
96		Z		
97	TOTAFO:	X	Tail only total aerodynamic force	$\underline{F}_{A_h}^{ht}$
98		Y		
99		Z		

CODE NUMBER	OUTPUT LABEL		DESCRIPTION	ENGINEERING SYMBOLS
100	TOTAMO:	X	Tail only total aerodynamic moment vector	$\underline{T}_{A_h}^{ht}$
101		Y		
102		Z		
103	HCACFO:	X	Hull only center of volume axis acceleration force vector	$\underline{F}_{AD_h}^{hcv}$
104		Y		
105		Z		
106	HCACMO:	X	Hull only center of volume axis acceleration moment vector	$\underline{T}_{AD_h}^{hcv}$
107		Y		
108		Z		
109	HOTAFO:	X	Hull only total aerodynamic force vector	$\underline{F}_{A_h}^{hcv}$
110		Y		
111		Z		
112	HOTAMO:	X	Hull only total aerodynamic moment vector	$\underline{T}_{A_h}^{hcv}$
113		Y		
114		Z		
115	VHGUST:	X	Hull CV linear gust velocity vector	$\underline{V}_h^{am\ cv}$
116		Y		
117		Z		
118	OHGUST:	X	Hull CV angular gust velocity vector	$\underline{\omega}_h^{am\ cv}$
119		Y		
120		Z		
121	VDRHGT:	X	Hull CV gust linear acceleration measured in hull c.g. reference axis	$\dot{\underline{V}}_h^{am\ cv}$
122		Y		
123		Z		
124	ODHGST:	X	Hull CV angular gust acceleration measured in hull c.g. axis	$\dot{\underline{\omega}}_h^{am\ cv}$
125		Y		
126		Z		
127	VTGUST:	X	Tail centroid linear gusts velocity vector	$\underline{V}_h^{am\ t}$
128		Y		
129		Z		
130	OTGUST:	X	Tail centroid angular gust velocity vector	$\underline{\omega}_h^{am\ t}$
131		Y		
132		Z		
133	VDRTGT:	X	Tail centroid linear acceleration measured in hull c.g. reference axis	$\dot{\underline{V}}_h^{am\ t}$
134		Y		
135		Z		

CODE NUMBER	OUTPUT LABEL		DESCRIPTION	ENGINEERING SYMBOLS
136 137 138	ODTGST:	X Y Z	Tail CV angular gust acceleration measured in hull c.g. axis	$\underline{\omega}_h^{\circ_{am\ t}}$
139	DUGDXH		Derivative of hull u-gust with hull x-location	$\partial u_h^{am\ cv}/\partial x$
140	DUGDYH		Derivative of hull u-gust with hull y-location	$\partial u_h^{am\ cv}/\partial y$
141	DVGDYH		Derivative of hull v-gust with hull y-location	$\partial v_h^{am\ cv}/\partial y$
142	DUGDXT		Derivative of tail u-gust with tail x-location	$\partial u_h^{am\ t}/\partial x$
143	DUGDYT		Derivative of tail u-gust with tail y-location	$\partial u_h^{am\ t}/\partial y$
144	DVGDYT		Derivative of tail v-gust with tail y-location	$\partial v_h^{am\ t}/\partial y$
145 146 147	GAHBFO:	X Y Z	Hull buoyancy force vector from gust accelerations	$\underline{F}_{GAB_h}^{hcv}$
148 149 150	GGHBFO:	X Y Z	Hull buoyancy force vector from gust gradients	$\underline{F}_{GGB_h}^{hcv}$
151 152 153	STATBF:	X Y Z	Hull aero-static buoyancy force vector	$\underline{F}_{SB_h}^{hcv}$
154 155 156	HGGAMF:	X Y Z	Hull gust-gradient force vector	$\underline{F}_{GG_h}^{hcv}$
157 158 159	HGGAMM:	X Y Z	Hull gust-gradient moment vector	$\underline{T}_{GG_h}^{hcv}$
160 161 162	TGGAMF:	X Y Z	Tail gust-gradient force vector	$\underline{F}_{GG_h}^{ht}$
163 164 165	TGGAMM:	X Y Z	Tail gust-gradient moment vector	$\underline{T}_{GG_h}^{ht}$

CODE NUMBER	OUTPUT LABEL		DESCRIPTION	ENGINEERING SYMBOLS
166 167 168	RVTAIL	X Y Z	Relative air mass linear velocity at tail center	$\underline{v}_h^{a\ t}$
169 170 171	RVHLCV	X Y Z	Relative air mass linear velocity at hull C.V.	$\underline{v}_h^{a\ cv}$
172 173 174	ROTAIL	X Y Z	Relative air mass angular velocity at tail center	$\underline{\omega}_h^{a\ t}$
175 176 177	ROHLCV	X Y Z	Relative air mass angular velocity at hull C.V.	$\underline{\omega}_h^{a\ cv}$
178 179 180	VHSENS	X Y Z	Sensor location air mass relative velocity	$\underline{v}_h^{a\ as}$
181	XSPEED		Forward Speed (Flight control system)	u_f
182	YSPEED		Lateral Speed (Flight control system)	v_f
183	ZSPEED		Vertical velocity (positive along minus z-axis)	$\dot{h}_f$
184 185 186	AXACC AYACC AZACC	X Y Z	X accelerometer measurement Y accelerometer measurement Z accelerometer measurement	$\dot{u}_f$ $\dot{v}_f$ $\dot{w}_f$
187	ROLLRT		Roll rate (Flight control system)	p_f
188	PTCHRT		Pitch rate (Flight control system)	q_f
189	TURNRT		Turn rate (Flight control system)	$\dot{\psi}_f$
190	UCOM		Forward velocity command	u_c
191	VCOM		Lateral velocity command	v_c
192	HDTCOM		Vertical velocity command (positive = up)	$\dot{h}_c$
193	PHICOM		Roll angle command	ϕ_c
194	THECOM		Pitch angle command	θ_c
195	TRATCM		Turn rate command	$\dot{\psi}_c$

CODE NUMBER	OUTPUT LABEL		DESCRIPTION	ENGINEERING SYMBOLS
196	UDCNTL		Longitudinal control output	$\dot{u}_c$
197	VDCNTL		Lateral control output	$\dot{v}_c$
198	WDCNTL		Vertical control output (positive - down)	$\dot{w}_c$
199	PCONTL		Roll control output	$\dot{p}_c$
200	QCONTL		Pitch control output	$\dot{q}_c$
201	RCONTL		Yaw control output	$\dot{r}_c$
202	UERR		Control system U-loop feedback error	u_e
203	VERR		Control system V-loop feedback error	v_e
204	HDTERR		Control system $\dot{H}$-loop feedback error	$\dot{h}_e$
205	PHIERR		Control system PHI-loop feedback error	ϕ_e
206	THEERR		Control system THETA-loop feedback error	θ_e
207	TRATER		Control system Turn Rate loop feedback error	$\dot{\psi}_e$
208	UINT		X-speed 'control system' integrator value	u_I
209	VINT		Y-speed 'control system' integrator value	v_I
210	HDTINT		Vertical velocity 'control system' integrator value	$\dot{h}_i$
211	PHIINT		Roll angle 'control system' integrator value	ϕ_I
212	THEINT		Pitch angle 'control system' integrator value	θ_I
213	TRTINT		Yaw rate 'control system' integrator value	$\dot{\psi}_I$
214	ROWFO:	X	Tail only steady flow force at the tail centroid	$\underline{F}_{SF_h}^{ht}$
215		Y		
216		Z		

CODE NUMBER	OUTPUT LABEL		DESCRIPTION	ENGINEERING SYMBOLS
217	RTOWMO:	X	Tail only steady flow moment at the tail centroid	$\underline{T}_{SF_h}^{ht}$
218		Y		
219		Z		
220	IERR:	X	Hover control system position-loop feedback error	x_{I_e}, y_{I_e},
221		Y		
222		Z		z_{I_e}
223	PSIERR		Heading angle error signal (Hover control)	ψ_e
224	PHRF:	X	Inertial accelerometer location at time POSHTI.	$\underline{R}_I^{h\ ac}\Big\|_{POSHTI}$
225		Y		
226		Z		
227	PHRF:PSI		Inertial heading at time POSHTI	$\psi_h\|_{POSHTI}$
228	IACELC	X	Accelerometer inertial location	$\underline{R}_I^{hac}$
229		Y		
230		Z		
231	HCBLFO	X	Total cable force acting on the hull	$\sum_{j=1}^{4} \underline{F}_{c_h}^{hj}$
232		Y		
233		Z		
234	HCBLMO	X	Total cable moment acting on the hull	$\sum_{j=1}^{4} \underline{R}_h^{hj} \times \underline{F}_{c_h}^{hj}$
235		Y		
236		Z		
237	GAMMAH		Angle (from vertical) of the relative angular velocity vector in the hull y-z plane	γ_h
238	LAMDAH		Angle (from vertical) of the relative linear velocity vector in the hull y-z plane	λ_h
239	ZETAH		GAMMAH-LAMDAH	ζ_h
240	NDHHT		Nondimensional hull height (ref. hull diameter)	$\hat{h}$
241	NDTHT		Nondimensional tail height (ref. tail span)	$\hat{h}_t$
242	RTIVEL	X	Rotor on tail interference velocity vector	$\sum_{i=1}^{4} \underline{V}_t^{int\ r\ i}$
243		Y		
244		Z		

CODE NUMBER	OUTPUT LABEL		DESCRIPTION	ENGINEERING SYMBOLS
245 246 247	PTIVEL:	X Y Z	Propeller on tail interference velocity vector	$\sum_{1}^{4} \underline{V}_t^{int\ p\ i}$
248 249 250	RHIVEL:	X Y Z	Rotor on hull interference velocit vector	$\sum_{i=1}^{4} \underline{V}_h^{int\ r\ i}$
251	RCFLWC		Rotor on hull crossflow correction	(Eq. 8-176)
252 253 254	PHIVEL:	X Y Z	Propeller on hull interference velocity vector	$\sum_{i=1}^{4} \underline{V}_h^{int\ p\ i}$
255	PCFLWC		Propeller on hull crossflow correction	(Eq. 8-176)
256 257 258	GHCIFO:	X Y Z	Ground on hull crossflow interference force	$\begin{bmatrix} 0 \\ (\Delta Y_h)_{ge} \\ (\Delta Z_h)_{ge} \end{bmatrix}_h^{hcv}$
259 260 261	GHCIMO:	X Y Z	Ground on hull crossflow interference moment	0
262	C FLOW C		Crossflow drag parameter including rotor and propeller on hull interference	$(Y_v\|v\|_h)'$
263	PDLTAL		Test command aileron deflection	$\Delta\delta_a$
264	PDLTEL		Test command elevator deflection	$\Delta\delta_e$
265	PDLTRD		Test command rudder deflection	$\Delta\delta_r$
266	SDLTAL		Flight control system command aileron deflection	δ_a
267	SDLTEL		Flight control system command elevator deflection	δ_e
268	SDLTRD		Flight control system command rudder deflection	δ_r
269	DELTAL		Aileron deflection angle	δ_a
270	DELTEL		Elevator deflection angle	δ_e
271	DELTRD		Rudder deflection angle	δ_r

CODE NUMBER	OUTPUT LABEL		DESCRIPTION	ENGINEERING SYMBOLS
272	ALPTØ*		Tail rolling angle of attack	α_{p_o}
273	PALPTØ*		Supplementary tail rolling angle of attack without aileron effects	α'_{p_o}
274	TIAC		Ground on tail induced angle of attack correction	TIAC
275	TCLC		Tail lift curve slope around effect	TCLC
276	ZAVSQT		Tail z-force derivative	
277 278 279	MORLOD:	X Y Z	Mooring load force vector on mast	$L_{Ih}\underline{F}_{C_h}^{hm}$
280 281 282	HOZLOD:	X Y Z	Vehicle (mooring) nose load force vector MFC(25-27)	$\underline{F}_{C_h}^{hm}$
283 284 285	HGERFO:	X Y Z	Total landing gear force vector acting on the hull	$\sum_{g=1}^{4} \underline{F}_{g_h}^{hg}$
286 287 288	HGERHO:	X Y Z	Total landing gear moment vector acting on the hull	$\sum^{4} \underline{R}_h^{hg} \times \underline{F}_{gh}^{hg}$
289 290 291	HGAAMF:	X Y Z	Hull gust acceleration force vector	$\underline{F}_{GA_h}^{hcv}$
292 293 294	HGAAMM:	X Y Z	Hull gust acceleration moment vector	$\underline{T}_{GA_h}^{hcv}$
295	LAMDPH		Ground induced hull flow rotation angle	λ'
296 297 298	VDHGST:	X Y Z	Hull C.V. total gust acceleration vector	$\underline{V}_h^{o_{am\ cv}}$

*Ø is a zero, O is the letter 'O'

CODE NUMBER	OUTPUT LABEL		DESCRIPTION	ENGINEERING SYMBOLS
299 300 301	VDTGST:	X Y Z	Tail centroid total gust acceleration vector	$\underline{V}_h^{o\,am\,t}$
302 303 304	GGRDAC:	X Y Z	Hull inertial gust gradient acceleration vector	$\frac{\partial \underline{V}_h^{am\,cv}}{\partial \underline{R}}\,\underline{V}_h^{am\,cv}$
305 306 307	MGDHAC:	X Y Z	Negative hull gust gradient acceleration vector	$-\frac{\partial \underline{V}_h^{am\,cv}}{\partial \underline{R}}\,\underline{V}_h^{a\,cv}$
308 309 310	MGDTAC:	X Y Z	Negative tail gust gradient acceleration vector	$-\frac{\partial \underline{V}_h^{am\,t}}{\partial \underline{R}}\,\underline{V}_h^{a\,t}$
311 312 313	TGAAMF:	X Y Z	Tail gust acceleration force	$\underline{F}_{GA_h}^{ht}$
314 315 316	TGAAMM:	X Y Z	Tail gust acceleration moment	$\underline{T}_{GA_h}^{ht}$

ALPHABETICAL LISTING

CODE NUMBER	OUTPUT LABEL		CODE NUMBER	OUTPUT LABEL	
75	ALPT		256	GHCIFO:	X
			257		Y
73	ALT		258		Z
272	ALPTØ*		259	GHCIMO:	X
			260		Y
184	AXACC	X	261		Z
185	AYACC	Y			
186	AZACC	Z	302	GGRDAC:	X
			303		Y
13	AXCGG		304		Z
14	AYCGG				
15	AZCGG		43	HABFOR:	X
			44		Y
74	BETAT		45		Z
262	C FLOW C		46	HABMOM:	X
			47		Y
269	DELTAL		48		Z
270	DELTEL		79	HBACFO:	X
			80		Y
271	DELTRD		81		Z
139	DUGDXH		82	HBACMO:	X
			83		Y
140	DUGDYH		84		Z
142	DUGDXT		103	HCACFO:	X
			104		Y
143	DUGDYT		105		Z
141	DVGDYH		106	HCACMO:	X
			107		Y
144	DVGDYT		108		Z
145	GAHBFO:	X	231	HCBLFO:	X
146		Y	232		Y
147		Z	233		Z
237	GAMMAH		234	HCBLMO:	X
			235		Y
148	GGHBFO:	X	236		Z
149		Y			
150		Z	192	HDTCON	

*Ø is a zero, O is the letter 'O'

CODE NUMBER	OUTPUT LABEL	
204	HDTERR	
210	HDTINT	
289	HGAAMF:	X
290		Y
291		Z
292	HGAAMM:	X
293		Y
294		Z
283	HGERFO:	X
284		Y
285		Z
286	HGERHO:	X
287		Y
288		Z
154	HGGAMF:	X
155		Y
156		Z
157	HGGAMM:	X
158		Y
159		Z
31	HOABF:	X
32		Y
33		Z
34	HOABMO:	X
35		Y
36		Z
109	HOTAFO:	X
110		Y
111		Z
112	HOTAMO:	X
113		Y
114		Z
280	HOZLOD:	X
281		Y
282		Z

CODE NUMBER	OUTPUT LABEL	
85	HTOTAF:	X
86		Y
87		Z
88	HTOTAM:	X
89		Y
90		Z
228	IACELC:	X
229		Y
230		Z
220	IERR:	X
221		Y
222		Z
238	LAMDAH	
295	LAMDPH	
305	MGDHAC:	X
306		Y
307		Z
308	MGDTAC:	X
309		Y
310		Z
277	MORLOD:	X
278		Y
279		Z
240	NDHHT	
241	NDTHT	
124	ODHGST:	X
125		Y
126		Z
136	ODTGST:	X
137		Y
138		Z
118	OHGUST:	X
119		Y
120		Z

CODE NUMBER	OUTPUT LABEL	
130	OTGUST:	X
131		Y
132		Z
4	P	
78	PALPT	
273	PALPTØ*	
76	PALT	
77	PBETAT	
255	PCFLWC	
199	PCONTL	
263	PDLTAL	
264	PDLTEL	
265	PDLTRD	
10	PHI	
193	PHICOM	
205	PHIERR	
211	PHIINT	
252	PHIVEL:	X
253		Y
254		Z
224	PHRF:	X
225		Y
226		Z
227	PHRF:PSI	
12	PSI	
223	PSIERR	
188	PTCHRT	

CODE NUMBER	OUTPUT LABEL	
245	PTIVEL:	X
246		Y
247		Z
5	Q	
200	QCONTL	
6	R	
251	RCFLWC	
201	RCONTL	
16	RHBFOR:	X
17		Y
18		Z
248	RHIVEL:	X
249		Y
250		Z
19	RHOAF:	X
20		Y
21		Z
22	RHOAMO:	X
23		Y
24		Z
49	RHOGFO:	X
50		Y
51		Z
52	RHOGMO:	X
53		Y
54		Z
55	RHOWFO:	X
56		Y
57		Z
58	RHOWMO:	X
59		Y
60		Z
187	ROLLRT	

CODE NUMBER	OUTPUT LABEL	
172	ROTAIL:	X
173		Y
174		Z
175	ROHLCV:	X
176		Y
177		Z
242	RTIvEL:	X
243		Y
244		Z
25	RTOAF:	X
26		Y
27		Z
28	RTOAMO:	X
29		Y
30		Z
61	RTOGFO:	X
62		Y
63		Z
64	RTOGMO:	X
65		Y
66		Z
214	RTOWFO:	X
215		Y
216		Z
217	RTOWMO:	X
218		Y
219		Z
169	RVHLCV:	X
170		Y
171		Z
166	RVTAIL:	X
167		Y
168		Z
266	SDLTAL	
267	SDLTEL	
268	SDLTRD	

CODE NUMBER	OUTPUT LABEL	
151	STATBF:	X
152		Y
153		Z
91	TCACFO:	X
92		Y
93		Z
94	TCACMO:	X
95		Y
96		Z
275	TCLC	
72	TDLMGM	
69	TDYFOR	
311	TGAAMF:	X
312		Y
313		Z
314	TGAAMM:	X
315		Y
316		Z
160	TGGAMF:	X
161		Y
162		Z
163	TGGAMM:	X
164		Y
165		Z
194	THECOM	
206	THEERR	
212	THEINT	
11	THETA	
274	TIAC	
37	TOAMOM:	X
38		Y
39		Z

CODE NUMBER	OUTPUT LABEL	
40	TOAFOR:	X
41		Y
42		Z
97	TOTAFO:	X
98		Y
99		Z
100	TOTAMO:	X
101		Y
102		Z
195	TRATCM	
207	TRATER	
213	TRTINT	
71	TSLMOM	
68	TSYFOR	
70	TSZFOR	
189	TURNRT	
67	TXFOR	
1	U	
190	UCOM	
196	UDCNTL	
202	UERR	
208	UINT	
2	V	
191	VCOM	
197	VDCNTL	
296	VDHGST:	X
297		Y
298		Z

CODE NUMBER	OUTPUT LABEL	
121	VDRHGT:	X
122		Y
123		Z
133	VDRTGT:	X
134		Y
135		Z
299	VDTGST:	X
300		Y
301		Z
203	VERR	
115	VHGUST:	X
116		Y
117		Z
178	VHSENS:	X
179		Y
180		Z
209	VINT	
127	VTGUST:	X
128		Y
129		Z
3	W	
198	WDCNTL	
7	X	
181	XSPEED	
8	Y	
182	YSPEED	
9	Z	
276	ZAVSQT	
239	ZETAH	
183	ZSPEED	

TABLE D-2. LPU VARIABLES (CODE NUMBERS LISTED IN SECOND SECTION OF INPUT DATA FILE OUTLST)

CODE NUMBER	OUTPUT LABEL		DESCRIPTION	ENGINEERING SYMBOLS
1	U		Velocity vector of each LPU	$\underline{V}_i$
2	V			
3	W			
4	PHID		LPU gimbal Euler rates	$\underline{\dot{\Theta}}_h^i$
5	THETD			
6	PSID			
7	X		LPU inertial position vector	$\underline{R}_I^i$
8	Y			
9	Z			
10	PHI		LPU gimbal Euler angles	$\underline{\Theta}_h^i$
11	THETA			
12	PSI			
13	CF	X	Constraint force vector for each LPU attach point	$\underline{F}_{C_h}^{hi}$
14	CF	Y		
15	CF	Z		
16	CM	X	Constraint moment vector for each LPU attach point	$\underline{T}_{C_h}^{hi}$
17	CM	Y		
18	CM	Z		
19	THEØR		Rotor blade collective pitch	θ_{o_r}
20	A1SR		Rotor lateral control axis deflection	A_{1s_r}
21	B1SR		Rotor longitudinal cyclic pitch	B_{1s_r}
22	OMEGR		Rotor spin rate	Ω_r
23	TR		Rotor thrust	T_r
24	QR		Rotor torque	Q_r
25	DSKLR		Disk loading on the rotor	T_r/A_r
26	POWER R		Required rotor engine power	P_{req_r}
27	AØR		Rotor blade coning angle	a_{o_r}

CODE NUMBER	OUTPUT LABEL		DESCRIPTION	ENGINEERING SYMBOLS
28	A1R		Rotor blade longitudinal flapping angle	a_{1_r}
29	B1R		Rotor blade lateral flapping angle	b_{1_r}
30	THEØP		Propeller blade collective pitch	θ_{o_p}
31	OMEGP		Propeller spin rate	Ω_p
32	TP		Propeller thrust	T_p
33	QP		Propeller torque	Q_p
34	DSKLP		Disk loading on the propeller	T_p/A_p
35	POWER P		Required propeller engine power	P_{req_p}
36 37 38	VGUST:	X Y Z	Gust linear velocity (LPU reference axis)	$\underline{V}_i^{am\ i}$
39 40 41	RVFUS:	X Y Z	LPU fuselage wind relative linear velocity at the fuselage aerodynamic reference center	$\underline{V}_i^{a\ f}$
42 43 44	FUSFO:	X Y Z	Fuselage aerodynamic force vector at the center of gravity	$\underline{F}_{A_i}^{if}$
45 46 47	PROPF:	X Y Z	Propeller aerodynamic force vector at the center of gravity	$\underline{F}_{A_i}^{ip}$
48 49 50	ROTFO:	X Y Z	Rotor aerodynamic force vector at the center of gravity	$\underline{F}_{A_i}^{ir}$
51 52 53	LPAFO:	X Y Z	LPU aerodynamic force vector at the center of gravity	$\underline{F}_{A_i}$
54 55 56	FUSMO:	X Y Z	Fuselage aerodynamic moment vector about the center of gravity	$\underline{T}_{A_i}^{if}$
57 58 59	PROPM:	X Y Z	Propeller aerodynamic moment vector about the center of gravity	$\underline{T}_{A_i}^{ip}$

CODE NUMBER	OUTPUT LABEL		DESCRIPTION	ENGINEERING SYMBOLS
60 61 62	ROTMO:	X Y Z	Rotor aerodynamic moment vector about the center of gravity	$\underline{T}_{A_i}^{ir}$
63 64 65	LPAMO:	X Y Z	LPU aerodynamic moment vector about the center of gravity	$\underline{T}_{A_i}$
66	CLAVR		Rotor blade mean lift coefficient	$\bar{C}_{L_r}$
67	ALAVR		Rotor blade mean angle of attack	$\bar{\alpha}_r$
68	CLAVP		Propeller blade mean lift coefficient	$\bar{C}_{L_p}$
69	ALAVP		Propeller blade mean angle of attack	$\bar{\alpha}_p$
70 71 72	RVLPU:	X Y Z	LPU relative wind linear velocity at the LPU center of gravity	$\underline{V}_i^a$
73	PTHEP		Propeller collective pitch increment test command	$\Delta\theta_{o_p}$
74	PTHER		Rotor collective pitch increment test command	$\Delta\theta_{o_r}$
75	PA1SR		Rotor lateral cyclic deflection increment test command	ΔA_{1s_r}
76	PB1SR		Rotor longitudinal cyclic deflection increment test command	ΔB_{1s_r}
77	STHEP		Propeller collective pitch flight control system command	θ_{o_p}
78	SOMGP		Propeller angular rate flight control system command	Ω_p
79	STHER		Rotor collective pitch flight control system command	θ_{o_r}
80	SOMGR		Rotor angular rate flight control system command	Ω_{o_r}
81	SA1SR		Rotor lateral cyclic deflection flight control system command	A_{1s_r}
82	SB1SR		Rotor longitudinal cyclic deflection flight control system command	B_{1s_r}

CODE NUMBER	OUTPUT LABEL		DESCRIPTION	ENGINEERING SYMBOLS
83 84 85	IVSOR:	X Y Z	Inertial gust linear velocity vector at the gust source	$\underline{V}_I^s$
86 87 88	VSORC:	X Y Z	Gust linear velocity at the gust source in hull reference axis	$\underline{V}_h^s$
89 90 91	HCBLF:	X Y Z	Total cable force vector at the hull c.g. (hull reference axis)	$\underline{F}_{c_h}$
92 93 94	HCBLM	X Y Z	Total cable moment vector at the hull c.g. (hull reference axis)	$\underline{T}_{c_h}$
95	NDRHT		Nondimensional rotor height (rotor diameter reference)	$\hat{h}_r$
96	NDPHT		Nondimensional propeller height (propeller ameter reference)	$\hat{h}_p$
97	GEFR		Ground on rotor interference correction	GEF_r
98	LCSRE		Rotor effective lift curve slope	a_r
99	GEFP		Ground on propeller interference correction	GEF_p
100	LCSPE		Propeller effective lift curve slope	a_p
101	VTR		Rotor thrust velocity	V_{t_r}
102	TWINR		Total rotor induced velocity	$(GEF_r)w_{in_r}$
103	VTP		Propeller thrust velocity	V_{t_p}
104	TWINP		Total propeller induced velocity	$(GEF_p)w_{in_p}$
105 106 107	ROTIV:	X Y Z	Rotor induced velocity vector (LPU reference axis)	$\underline{V}_i^{in\ r}$
108 109 110	PRPIV:	X Y Z	Propeller induced velocity vector (LPU reference axis)	$\underline{V}_i^{in\ p}$

CODE NUMBER	OUTPUT LABEL		DESCRIPTION	ENGINEERING SYMBOLS
111	RFIV:	X	Rotor on fuselage interference velocity vector	$(KRF)\underline{V}_i^{int\ r}$
112		Y		
113		Z		
114	PFIV:	X	Propeller on fuselage interference velocity vector	$(KPF)\underline{V}_i^{int\ p}$
115		Y		
116		Z		
117	RPIV:	X	Rotor on propeller interference velocity vector	$(KRP)\underline{V}_i^{int\ r}$
118		Y		
119		Z		
120	DELTA R		Rotor blade drag coefficient	δ_r
121	DELTA P		Propeller blade drag coefficient	δ_p
122	RVROT:	X	Rotor relative linear velocity vector	$\underline{V}_i^{a\ r}$
123		Y		
124		Z		
125	RVPRP:	X	Propeller relative linear velocity vector	$\underline{V}_i^{a\ p}$
126		Y		
127		Z		
128	LGLNT		Landing gear length	ℓ_g
129	GERIL:	X	Landing gear inertial location	$\underline{R}_I^{hg}$
130		Y		
131		Z		
132	GERFO:	X	Landing gear force vectors at the ground contact points	$\underline{F}_{g_h}^{hg}$
133		Y		
134		Z		
135	HGRMO:	X	Landing gear moment vectors about the hull c.g.	$(\underline{R}_h^{hg} \times \underline{F}_{g_h}^{hg})$
136		Y		
137		Z		
138	FRTMG		Rolling friction magnitude on landing gears	$\mu_k F_{g_I}^{hg}(3)$
139	GCFOR:	X	Landing gear compression force vector (third component of $\underline{F}_{g_h}^{hg}$)	$\underline{F}_{g_h}^{hg}$
140		Y		
141		Z		
142	GFFOR:	X	Landing gear friction force vector (first and second components of $\underline{F}_{g_h}^{hg}$)	$\underline{F}_{g_h}^{hg}$
143		Y		
144		Z		

CODE NUMBER	OUTPUT LABEL		DESCRIPTION	ENGINEERING SYMBOLS
145	GCPRS		Landing gear compression force magnitude	$F_{g_h}^{gh}(3)$
146	GRAT		Landing gear compression rate	$\dot{\ell}_g$
147	JETHS		Exhaust jet force magnitude	T_e
148	JETFO:	X	Exhaust jet force vector at LPU c.g.	$\underline{F}_{e_i}$
149		Y		
150		Z		
151	JETMO:	X	Exhaust jet moment vector about LPU c.g.	$\underline{T}_{e_i}^{ie}$
152		Y		
153		Z		

ALPHABETICAL LISTING

CODE NUMBER	OUTPUT LABEL		CODE NUMBER	OUTPUT LABEL	
69	ALAVP		99	GEFP	
67	ALAVR		97	GEFR	
27	AØR		132	GERFO:	X
			133		Y
20	A1R		134		Z
28	A1SR		129	GERIL:	X
			130		Y
29	B1R		131		Z
21	B1SR		142	GFFOR:	X
			143		Y
13	CF	X	144		Z
14	CF	Y			
15	CF	Z	146	GRAT	
68	CLAVP		89	HCBLF:	X
			90		Y
66	CLAVR		91		Z
16	CM	X	92	HCBLM:	X
17	CM	Y	93		Y
18	CM	Z	94		Z
121	DELTA P		135	HGRMO:	X
			136		Y
120	DELTA R		137		Z
34	DSKLP		83	IVSOR:	X
			84		Y
25	DSKLR		85		Z
138	FRTMG		148	JETFO:	X
			149		Y
42	FUSFO:	X	150		Z
43		Y			
44		Z	147	JETHS	
54	FUSMO:	X	151	JETMO:	X
55		Y	152		Y
56		Z	153		Z
139	GCFOR:	X	100	LCSPE	
140		Y			
141		Z	98	LCSRE	
145	GCPRS		128	LGLNT	

CODE NUMBER	OUTPUT LABEL	
51	LPAFO:	X
52		Y
53		Z
63	LPAMO:	X
64		Y
65		Z
96	NDPHT	
95	NDRHT	
31	OMEGP	
22	OMEGR	
75	PA1SR	
76	PB1SR	
114	PFIV:	X
115		Y
116		Z
10	PHI	
4	PHID	
35	POWER P	
26	POWER R	
45	PROPF:	X
46		Y
47		Z
57	PROPM:	X
58		Y
59		Z
108	PRPIV:	X
109		Y
110		Z
12	PSI	
6	PSID	
73	PTHEP	

CODE NUMBER	OUTPUT LABEL	
74	PTHER	
33	QP	
24	QR	
111	RFIV:	X
112		Y
113		Z
49	ROTFO:	X
50		Y
51		Z
105	ROTIV:	X
106		Y
107		Z
60	ROTMO:	X
61		Y
62		Z
117	RPIV:	X
118		Y
119		Z
39	RVFUS:	X
40		Y
41		Z
70	RVLPU:	X
71		Y
72		Z
125	RVPRP:	X
126		Y
127		Z
122	RVROT:	X
123		Y
124		Z
81	SA1SR	
82	SB1SR	
78	SOMGP	
80	SOMGR	

CODE NUMBER	OUTPUT LABEL
77	STHEP
79	STHER
11	THETA
5	THETD
30	THEØP
19	THEØR
32	TP
23	TR
104	TWINP
102	TWINR
1	U

CODE NUMBER	OUTPUT LABEL	
2	V	
36	VGUST:	X
37		Y
38		Z
86	VSORC:	X
87		Y
88		Z
103	VTP	
101	VTR	
3	W	
7	X	
8	Y	
9	Z	

TAPLE D-3. PAYLOAD VARIABLES

(Code numbers listed in first section of input data file PYOUTL)

CODE NUMBER	OUTPUT LABEL		DESCRIPTION	ENGINEERING SYMBOLS
1	PU		Paylcad linear velocity	
2	PV			$\underline{V}_p$
3	PW			
4	PP		Payload angular velocity	
5	PQ			$\underline{\omega}_p$
6	PR			
7	PX		Payload location relative to hull	
8	PY			$\underline{R}_h^p$
9	PZ			
10	PPHI		Payload Euler angle orientation	
11	PTHETA			$\underline{n}_I^p$
12	PPSI			
13	PAXCGG		Payload c.g. inertial X acceleration (g's)	
14	PAYCGG		Payload c.g. inertial Y accleration (g's)	$1/g[\overset{\circ}{\underline{V}}_p +$
15	PAZCGG		Payload c.g. inertial Z acceleration (g's)	$(\underline{\omega}_p \times \underline{V}_p)]$
16	VPAYRL:	X	Hull relative payload velocity	
17		Y		$\underline{V}_h^p$
18		Z		
19	PAYIPO:	X	Payload c.g. inertial position	
20		Y		$\underline{R}_I^p$
21		Z		
22	PCBLFO:	X	Total cable force on payload	
23		Y		$\sum_{k=1}^{4} \underline{F}_{c_p}^{pk}$
24		Z		
25	PCBLMO:	X	Total cable moment about payload	
26		Y	c.g.	$\sum_{k=1}^{4} (\underline{R}_p^{pk} \times \underline{F}_{c_p}^{pk})$
27		Z		

CODE NUMBER	OUTPUT LABEL		DESCRIPTION	ENGINEERING SYMBOLS
28 29 30	PYAFOR:	X Y Z	Payload aerodynamic force at the center of gravity	$\underline{F}_{A_p}$
31 32 33	PYAMOM:	X Y Z	Payload aerodynamic moment at the center of gravity	$\underline{T}_{A_p}$
34 35 36	STATPF:	X Y Z	Static aerodynamic payload force at the aerodynamic reference center	$\underline{F}_{SA_p}^{pc}$
37 38 39	STATPM:	X Y Z	Static aerodynamic payload moment at the aerodynamic reference center	$\underline{T}_{SA_p}^{pc}$
40 41 42	DYNAPM:	X Y Z	Dynamic payload moment at the aerodynamic reference center	$\underline{T}_{DA}^{pc}$
43 44 45	RPWFOR:	X Y Z	Payload aerodynamic force at the aerodynamics reference center	$\underline{F}_{A_p}^{pc}$
46 47 48	RPWMOM:	X Y Z	Payload aerodynamic moment at the aerodynamic reference center	$\underline{T}_{A_p}^{pc}$
49 50 51	RVPAYC:	X Y Z	Payload relative linear velocity	$\underline{V}_p^{a\ pc}$
52 53 54	ROPAYC:	X Y Z	Payload relative angular velocity	$\underline{\omega}_p^{a\ pc}$
55 56 57	VPGUST:	X Y Z	Payload linear gust velocity	$\underline{V}_p^{am\ pc}$
58 59 60	OPGUST:	X Y Z	Payload angular gust velocity	$\underline{\omega}_p^{am\ pc}$

ALPHABETICAL LISTING

CODE NUMBER	OUTPUT LABEL	
40	DYNAPM:	X
41		Y
42		Z
58	OPGUST:	X
59		Y
60		Z
13	PAXCGG	
14	PAYCGG	
19	PAYIPO:	X
20		Y
21		Z
15	PAZCGG	
22	PCBLFO:	X
23		Y
24		Z
25	PCBLMO:	X
26		Y
27		Z
4	PP	
10	PPHI	
12	PPSI	
5	PQ	
6	PR	
11	PTHETA	
1	PU	
2	PV	
3	PW	
7	PX	
8	PY	
28	PYAFOR:	X
29		Y
30		Z
31	PYAMOM:	X
32		Y
33		Z
9	PZ	
52	ROPAYC:	X
53		Y
54		Z
43	RPWFOR:	X
44		Y
45		Z
46	RPWMOM:	X
47		Y
48		Z
49	RVPAYC:	X
50		Y
51		Z
34	STATPF:	X
35		Y
36		Z
37	STATPM:	X
38		Y
39		Z
16	VPAYRL:	X
17		Y
18		Z
55	VPGUST:	X
56		Y
57		Z

TABLE D-4. CABLE VARIABLES

(Code numbers listed in second section of input data file PYOUTL)

CODE NUMBER	OUTPUT LABEL		DESCRIPTION	ENGINEERING SYMBOLS
1 2 3	PCBLF:	X Y Z	Cable force vectors at payload c.g.	$\underline{F}_{c_p}^{pk}$
4 5 6	PCBLM:	X Y Z	Cable moment vectors at payload c.g.	$(\underline{k}_p^{pk} \times \underline{F}_{c_p}^{pk})$
7	CBLTH		Cable length	$\ell_{o_{jk}}$
8	CLRAT		Cable stretch rate	$\dot{\ell}_{jk}$
9	CBLTN		Cable tension	F_{jk}
10			Not used	
11			Not used	
12			Not used	
13 14 15	HCBLF:	X Y Z	Cable force vectors at hull attach points	$F_{c_h}^{hj}$

ALPHABETICAL LISTING

CODE NUMBER	OUTPUT LABEL	
10		
11		
12		
7	CBLTH	
9	CBLTN	
8	CLRAT	
13	HCBLF:	X
14		Y
15		Z
1	PCBLF:	X
2		Y
3		Z
4	PCBLM:	X
5		Y
6		Z

Code Numbers 10, 11, and 12 were not used.

APPENDIX E

The messages printed by this program fall into four general categories:

1) Messages which indicate incorrect inputs.

2) Messages which are defensive in nature. They should never be printed in the present program, but they might be triggered if the code is improperly altered in the future.

3) Messages which are printed to indicate program conditions of interest to the programmer or engineer. They may or may not cause the program to be terminated.

4) Messages which are printed indicating some kind of error condition has arisen in the program and the program is being terminated.

MESSAGES:

-

001
ABSOLUTE VALUE OF PANGLE IS GREATER THAN 1/2 PI.
Notes: A defensive message. These values are tested on input, but they are tested again at this time for the possibility of scrambled data.

-

002
CONTROL COMMAND TIMES WERE NOT INPUT IN INCREASING ORDER.
Notes: Incorrect inputs; check data list.

-

003
CONVERGED SOLUTION OF CT AND WIN IS INCORRECT.
Notes: This message indicates an improper convergence in subroutine CALCCT. If this message apears during the trim run, it is an informative message only, because the trim will continue restarting until it gets values that are converged. If this message appears during a time history run, some of the values printed at that time frame will probably be incorrect.

-

004
CT AND WIN DID NOT CONVERGE.
Notes: This message is an informative message only when this condition occurs the values are returned to CALCCT which will restart its convergence calculations to arrive at correct values. The value function (FUNCT) would have been close to zero if the subroutine had converged.

-

005
TVC COLUMN NUMBER EXCEEDS 24.
Notes: Defensive message. Check for improper arguments being passed into subroutine IN1MOD.

006
TVC ROW NUMBER EXCEEDS 30.
Notes: Defensive message. Check for improper arguments being passed into subroutine IN1MOD.

007
SROWN WILL EXCEED 30.
Notes: Check subroutine RMASS for improper argument SROWN. If this argument is greater than 25 when the subroutine is called, it will cause an attempt to access a location in the inverted mass matrix greater than 30.

008
GUSTT1 IS GREATER-EQUAL TO GUSTT2.
Notes: These values were tested on input. They are being tested again here to insure that data has not been scrambled after the input.

009
LCS OR SIGMA IS LESS THAN ZERO.
Notes: Check the input values of LCSR1-4 or CORDR1-4 or LCSP1-4 or CORDP1-4 for a negative alue.

010
LENGTH OF VCTR IS NOT 6, 12, 24, or 42.
Notes: A defensive message. Check subroutines which call subroutine PTURB.

011
MORE THAN 20 CONTROL COMMANDS WERE INPUT.
Notes: Only 20 commands are allowed.

012
NO REAL POSITIVE ROOTS WERE FOUND BY THE IMSL ROUTINE.
Notes: With the present polynomial being calculated in subroutine inflow. This message should never appear.

013
CURRENT AERODYNAMIC ANGLES DO NOT SATISFY ANY OF THE POSSIBLE CONDITIONS
Notes: A defensive message. Check for improper calling arguments or incorrect stall parameters.

014
SQROOT IS NEAR ZERO. POSSIBLE DIVISION BY ZERO.
Notes: A defensive message. This value should never be zero in the present model, but any alterations to subroutine CALCCT or ITERCT may cause this to be printed.

015
STABILITY DERIVATIVES WILL NOT BE CALCULATED FOR THIS TRIM.
Notes: The trim routine sets a flag which will prevent the calculation of stability derivatives if the trim did not converge.

016
STALL REGION ANGLE 1 IS GREATER THAN STALL REGION ANGLE 2.
Notes: A defensive message. These values are tested on input, but they are tested again at this time for the possibility of scrambled data.

017
SOME OF THE STALL REGION ANGLES WERE NEGATIVE.
Notes: A defensive message. These values are tested on input, but they are tested again at this time for the possibility of scrambled data.

018
SOME OF THE AERODYNAMIC ANGLES OF THE TAIL ARE GREATER THAN PI.
Notes: A defensive message. These values are tested on input, but they are tested again at this time for the possibility of scrambled data.

019
TIME IS GREATER THAN LAST COMMAND TIME WHICH SHOULD BE THE SAME AS THE FINAL SIMULATION TIME.
Notes: Defensive message. Subroutine SETCMD should have inserted in the last position of the command string the simulation time and a command equal to the last command which the user input.

020
TIME IS LESS THAN THE FIRST COMMAND TIME WHICH SHOULD BE ZERO.
Notes: Defensive message. If the user did not input a command at time zero, subroutine SETCMD will put the trim value with time zero in the first position.

021
T1COM IS GREATER-EQUAL TO T2COM.
Notes: A defensive message. These values are tested on input, but they are tested again at this time for the possibility of scrambled data.

022
INCORRECT INPUTS
Notes: Check data list and restrictions on input values.

023
IMSL ROUTINE HAS RETURNED AN ERROR FLAG. ROUTINE NAME IS THE FIRST VARIABLE GIVEN BELOW.

Notes: The IMSL routine which returned the error flag is printed as the first variable name. IER is the IMSL error flag. Consult the IMSL manual for the meaning of the error.

024
CDFLAG IS NOT SET TO -1, 0, OR 1 ON RETURN FROM SUBR. ITERCT.

Notes: Defensive message check subroutine ITERCT and subroutine CALCCT.

025
LESS THAN 4 ZEROS WERE FOUND BY IMSL ZRPOLY

Notes: It is possible that IMSL-ZRPOLY may not find all four solutions to the 4th order equation. This may mean the program attempts to use the wrong solution.

026
REQUIRED TRIM CONTROL EXCEEDED AVAILABLE INTEGRATION LIMITS. IF LOOP CLOSED THE INTEGRATOR WILL BE SET TO LIMIT.

Notes: The trim values may be larger than the integrator limits which were input. In this case subroutine loop will use the integrator value if that loop is closed. This will have the same effect as having a command of the limit value at time 0.0 seconds.

027
THE TIME IS LESS THAN OLDTIM. THIS IS AN IMPOSSIBLE SITUATION.

Notes: Defensive message. This would probably only occur if the time were to decrease during the simulation of if PROFIL were to be called with a negative time.

028
THE TIME READ FROM THIS FILE IS LESS THAN ZERO. THE TIME AND GUST VELOCITY WILL BE IGNORED.

Notes: One of the gust string files (FILE31, FILE32, FILE33, or FILE34) contained negative time.

029
THE TIME IS GREATER-EQUAL TO 100000. Notes: Defensive message. The user has input a gust time greater than 100,000.

030
CONDITION FLAGS FROM IMSL ROUTINE DVERK.

Notes: Debug message, not used in present version of the program.

031
TIME INCREMENT IS LESS THAN ZERO.

Notes: TIMSTP must be greater than zero.

032
THE LENGTH OF THE VECTOR PASSED INTO PPTURB IS NOT 6 OR 12
Notes: Defensive message which will only appear if the payload stability derivatives are incorrectly altered.

033
THE VALUE OF VCTRFL IS NOT VALID
Notes: Defensive message which will appear if the linearization module is incorrectly altered. VCTRFL indicates which stability derivative matrice is being calculated.

034
SOME OF THE INVALID STABILITY DERIVATIVES HAVE NOT BEEN FLAGGED BECAUSE THE ARRAY IS FULL.
Notes: During the stability derivative calculations points which have strong nonlinearities will be flagged. The array holding these flagged values has a length of 300. This message is written when more than 300 are found.

035
THE LINEARIZATION LINEAR INCREMENTS ARE LARGE ENOUGH TO CAUSE SOME OF THE CABLES TO GO SLACK. THEY ARE BEING RESET.
Notes: During stability derivative calculations the perturbation increments must not cause any cables to go slack. If the values initialized in subroutine "Initial" may cause this to happen then they will be reduced based on the cable geometry.

036
THE LINEARIZATION ANGULAR INCREMENTS ARE LARGE ENOUGH TO CAUSE SOME OF THE CABLES TO GO SLACK. THEY ARE BEING RESET.

037
THE LENGTH OF THE SV VECTOR IS NOT CONSISTANT WITH THE SIZE OF THE BLANK BLOCKS FOR EXTRA INTEGRATOR STATES.
Notes: This is a defensive comment and will appear if future changes do not correctly change the length of the SV vector and the BLKSI2. If this message appears the declarations of SV, GVLNTH, BLKINT and BKDINT must be carefully checked wherever they appear. All time history data from that run will be useless.

038
THE TIMSTP OR MINSTP INPUT IS GREATER THAN THE APROX. CABLE FREQ/10 AND MAY CAUSE NUMERICAL INACCURACIES.
Notes: This is a warning message indicating that the timestep is too large to accurately calculate the effects of high cable frequencies. The program will give a recommended time step for these calculations.

039
IMSL DVERK WAS UNABLE TO REACH THE SPECIFIED 'RITERIA WITHOUT GOING BELOW THE MINIMUM TIME STEP.

Notes: This indicates that the IMSL DVERK tried to reduce its timestep below that allowed by MINSTP in an attempt to meet the error tolerance of 0.0001. At this point the program will force acceptance of the last attempt and continue execution. The value C(19) will give an indication of how close the calculation was to being within the error critera.

040
THE FLAG FOR THIS SUBROUTINE WAS NOT FOUND IN THE DATA FILE (TAPE20)

Notes: In order to have program HLASIM, HLAPAY AND HALMOR use the same data files, it is necessary to insert flags to allow that data which is not needed to be skipped. Check the data files, and User's Manual for the correct position of these flags.

041
WAKE ANGLE 1 MUST BE LESS THAN ANGLE 2, AND BOTH MUST BE BETWEEN 0 AND 2*PI

Notes: Invalid values for the wake angles were input.

042
THIS VALUE WILL CAUSE DIVISION BY ZERO

Notes: Can indicate invalid inputs or that the program has obtained a value very near zero with which it will have to divide.

043
MORE THAN MAX NUMBER OF OUTPUT VARIABLES WERE REQUESTED.

Notes: The maximum number of code numbers allowed in input files OUTLST and PYOUTL are:

Hull variables requested	- 500
LPU variables requested	- 250
Payload variables requested	- 100
Cable variables requested	- 100

044
AN INITIAL GUESS WITH LANDING GEAR IN GROUND CONTACT AND PITCH ANGLE LESS THAN 1.0 COULD NOT BE FOUND.

Note: The trimmer must find a legal initial guess — some compression in all active landing gears and the pitch angle less than 1.0 radians. This message probably indicates an error in the user defined geometry.

045
LINEARIZATION INCREMENT COULD LIFT ONE OF THE LANDING GEARS OFF THE GROUND. IT IS BEING RESET.

Note: If some of the stability derivative increments are large enough to lift a landing gear off the ground they will invalidate the linearization analysis. The program calculates an appropriate increment and uses it. This message is informative only and the program will continue.

045
ALL ROTOR LIFT CURVE SLOPES CANNOT BE ZERO.

Note: At least one rotor must have a nonzero lift curve slope (LCSR1-4).